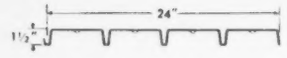
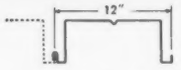
Architectural & Engineering News, January 1960, Volume 2, Number 1

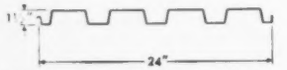
When it comes to roof systems, INLAND covers everything!



A-DECK — For purlin spacings not exceeding 8'4". Narrow ribs provide deck surface that supports the thinnest or softest type of insulation.

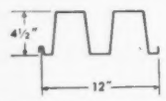


H-DECK — New! For simple spans from 10'0" to 20'0" — 3 and 4½" depths. Especially practical to cover walkways in shopping centers, schools, other installations.



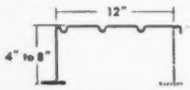
B-DECK — For spans to 10'0". Wide rib distributes metal for greater structural efficiency — gives higher section properties per pound of steel — well suited for use as side wall panels.

B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70 — used for spans to 10'0".



C-DECK—Carries normal roof loads over spans up to 24'0". Used extensively in canopies.

C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24'0".



T-STEEL — New! Galvanized only — for clear spans to 32'0". Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to transmit seismic and wind loads.

RIBFORM — High tensile galvanized steel form for concrete slabs over spans up to 8'0". Three types: Standard, Heavy-Duty, Super-Duty.

Whether your design calls for a dry insulation board roof or for wet-fill, there's an Inland roof system for the job — by the makers of famous Milcor steel building products.

Inland steel deck weighs less than half as much as poured-in-place or pre-cast construction. You can space joists wider and use lighter framework, to save both time and money. Panels are easy to handle and weld in place — in any weather that a man can work.

Types A, B, C, and H decks have the additional advantage of a Bonderized, baked-enamel prime finish that resists on-the-job damage. One field coat of paint on these Inland decks usually covers.

Write for catalogs 240, 241, and 245 — or see Sweet's sections 2c/Inl, 11a/In, and 2a/In.

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Addess all correspondence Architectural & Enginee News, 452 Fifth Avenue, York 18, N.Y.

BPA

Still dimly perceived, the 1960 ushers in a new de which holds high hope an cellent promise for the a tectural and engineering fessions. Tony Pallad graphic statement for month's cover underscore editorial emphasis given w this issue to the areas of fessional growth and tec logical advance. Photo b Mancuso.

< Circle 101 for further information

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45 Editorial: the decade before us

4 Forecast: housing outlook for 2000 A.D.

13 The professions: the decade ahead

16 Technology & techniques: 1960

Sample 1:
engineered t&g joint
compression cross-bridging

Sample 2:
light-source advances
ac/lighting combined

Sample 3:
bonded panel joint buildings
load-bearing molded structures

Sample 4:
small steel arches

Sample 5:
burning through concrete

2 Communications

3 Gazette

6 A/E news

23 Products, equipment, materials

34 Documents

35 Preview: 13/United Church of Squaw Valley

36 Literature

42 Abstracts: economic value of design
realty lease-back deals

43 Digest: 13/roofing system development

44 Books: the world beneath the city

45 Names: John S. Bolles, AIA

47 Calendar

46 Index to advertisers

Readers service cards
facing pages 1 and 46

COMMUNICATIONS

Editor:
I have received today the December issue of your excellent magazine. Many thanks. I will appreciate it very much if you will advise me as to the mailing address of the *American Society of Golf Course Architects*. The secretary's name would be helpful, but it is not essential.
Thanking you for your cooperation, I am.

Sincerely yours,
Colonel R. Otto Probst, PE
The Golf Library
334 No. Hill Street
South Bend 17, Ind.

Editor's note: *To the best of our knowledge we don't know about this group; therefore we are throwing Col. Probst's request on the tender mercies and sympathies of our readers. Golf Course Architects, anyone?*

The Guggenheim Museum

Editor:
. . . [Re] your excellent editorial in Architectural & Engineering News. Not only was it an interesting and gratifying notice of the Museum but also a very kind one to me. . . .

Sincerely yours,
James Johnson Sweeney, Director
The Solomon R. Guggenheim Museum,
New York, N.Y.

Editor:
It would be a sorry world if we all thought alike, and I must say that you said some very nice things about me in the course of disagreeing with my comments on the Guggenheim Museum. I enjoyed yours very much. . . .

Sincerely,
John Canaday
Art Critic
The New York Times

Editor:
Congratulations on your beautiful article about the Guggenheim. You have shown not only a deep comprehension of a very difficult masterpiece, but real perspective in placing it relative to the other museums of the world. A pat on the back also for extraordinary tact in dealing with the myopic Canaday and various shortcomings of the building, such as the lighting and hanging arrangements.

Cordially,
Henry Steinhardt, AIA
Steinhardt & Thompson,
Architects
New York, N. Y.

Editor:
Your description of the Guggenheim Museum is the finest I have seen.
In the event that Mrs. Wright has not seen it, I have passed my copy on to her.

Very truly yours,
Edgar Tafel, AIA
Edgar Tafel Associates,
Architects
New York, N.Y.

Tectum is Now Silicone Treated for Water Repellency

A Report from Tectum Research and Development

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Tectum is *now* water repellent. Every fiber in the composition of Tectum building materials is now treated with *Fiberguard*. This is not a mere surface treatment; the new *Fiberguard* process coats each fiber throughout the board with a specially formulated protective silicone. This outstanding product improvement is the result of three years intensive research by Tectum's Research and Development Department.

Here's What It Means To You, Mr. Architect: *Capillarity is virtually eliminated;* water migration is limited to exposed areas only. The inherent advantages of Tectum's insulating, acoustical and structural properties are now doubly protected. The hazards of inclement weather are sharply reduced during erection and the possibility of interior staining in later years due to roof leaks is greatly minimized. Result — greater client satisfaction.

And For You, Mr. Contractor, A Real Bonus: Improved Tectum offers added protection against roof deck damage. If sudden showers dampen the unfelted edges of Tectum deck or if water leaks around unflashed roof openings, only the immediate exposed area is affected. Naturally, good practice dictates that proper precautions be taken in material storage and handling, but the hazard of possible staining from weather exposure is now effectively minimized. In case of roof leaks, water will drip vertically through the porous deck enabling you to quickly locate the source of the problem. Best of all there is practically no capillary migration laterally around the point of the leak. And, here is the big news; *the new improved Tectum doesn't cost one cent extra.* The price remains the same.

The Fiberguard silicone treatment is colorless, and odorless — does not change the natural color of the factory finished material. None of the inherent values including insulation and sound absorption are affected, and the weight remains the same. The general attractive appearance of the product is unchanged. The improved Tectum may be painted with oil or water base paints.

For complete details on this new manufacturing achievement — How Tectum board is now even better for roof decks, form plank and the many special applications as a structural insulating and acoustical material — see your Tectum representative at the first opportunity, or write the General Offices in Columbus, Ohio. Find out how laboratory tests have proved the advantages of the new *Fiberguard* repellent; how three years of testing and perfecting have developed an even finer Tectum for your building projects.

IMPROVED PRODUCT — NEW VALUE — SAME COST

Remember, Tectum has more inherent benefits as a roof deck material than any other product on the market.

Structural	Rot and Termite Resistant
Insulative	Factory Finished
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Noncombustible	Beveled (Exposed Edge)
Dimensionally Stable	Felt Backed
Light Weight	
Decorative	
Light Reflective	

and NOW has Water Repellency with Fiberguard

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GAZETTE

James C. Bunyard, PE, appointed district engineer by *The Asphalt Institute* at Atlanta, Ga.

Carl B. Jansen elected chairman of the board and chief executive officer; William E. Clark president and chief operating officer of Dravo Corp., Pittsburgh, Pa.

Richard S. Latham elected president for 1959-1960 of the *American Society of Industrial Designers.* Raymond Spilman elected vice president; Clarence Francis Graser, national secretary. Kenneth Van Dyck reelected treasurer.

Ralph W. Sterling appointed executive director of development and public relations at Illinois Institute of Technology. Formerly served as vice president of Pratt Institute, Brooklyn, N. Y.

Richard E. Lander, PE, appointed project engineer in Investigation, Standardization and Improvement Department of Keasbey & Mattison Co., Ambler, Pa.

Ernest E. Kirwan, instructor in Architecture at the Rhode Island School of Design, Providence, R. I., invited to join the National Selection Committee of the *Institute of International Education* in New York. Institute makes preliminary selection of applicants seeking awards under the Fulbright Program.

Kenneth C. Allen appointed secretary of Committee on Commercial Research of *American Iron and Steel Institute.*

Following were elevated to rank of Fellow by *Illuminating Engineering Society:* Richard D. Bradley; George W. Clark; Berlon C. Cooper; Robert T. Dorsey; Lawrence E. Johnson; Elton A. Lindsay; Prof. Stanley McCandless; and Miss Pricilla Presbrey.

Leon Chatelain, Jr., FAIA, past president of the AIA, appointed chairman of committee of *American Standards Association* to study planning of public buildings as related to the requirements of the physically handicapped.

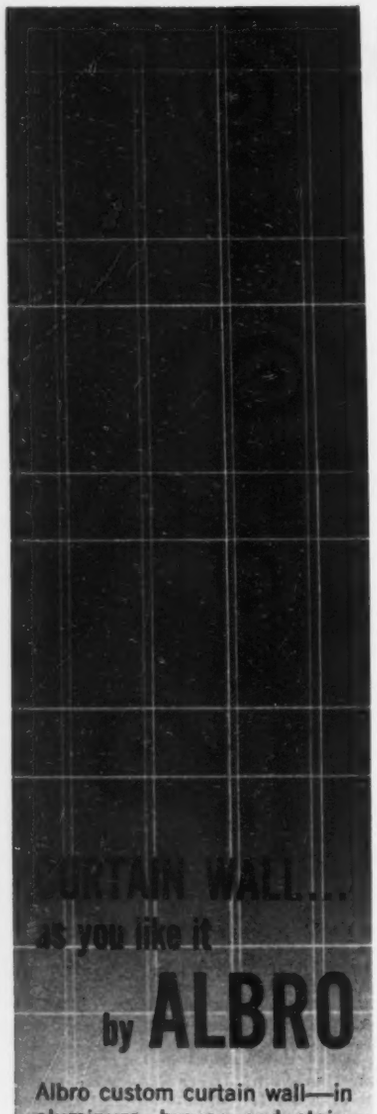
Clarence S. Stein, FAIA, and Albert Mayer, FAIA, of New York, presented papers headed "Israel Plans a Nation," at the 2nd Annual Conference on Science and Technology in Israel and the Middle East.

H. Buckley Dietrich re-elected president of *American Institute of Steel Construction,* at 37th annual convention. Others re-elected are: James M. Straub, first vice-president; Harold G. Lewis, second vice-president; M. Harvey Smedley, secretary; Erwin P. Stupp, treasurer; and L. Abbett Post, executive vice-president.

Office announcements

Office of Emanuel Weisfeld, AIA, to 455 Northeast 22nd St., Miami 37, Fla.

Pursuant to the death of Mr. Peaslee, the architectural practice of Horace W. Peaslee, FAIA, and Frank W. Cole, AIA, 1228 Connecticut Ave., Washington, D. C., is being continued by Mr. Cole.



Albro custom curtain wall—in aluminum, bronze and stainless steel—gives the architect any system his design demands. From engineering to installation, ALBRO assumes total responsibility for the quality and performance of all architectural fabrications leaving its plant. This policy has stood for ALBRO's 30-years-plus of metal engineering know-how. For more information, please ask for ALBRO's complete set of curtain wall, window and architectural metalwork catalogs on your company letterhead.

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Housing outlook for 2000 A.D.

From a talk by Julian H. Zimmerman, Commissioner of Federal Housing Administration, before the National Lumber Manufacturer's Assn., Washington, D. C., November 10, 1959.

". . . In projecting conditions to the year 2000, I again want to point out that I am speaking personally, not for the Government. Some of the figures I have used are projections of recent studies by the Joint Economic Committee comparing our rate of growth, the gross national product, and so forth, with the Soviet Union.

"My projections are contingent on three basic assumptions: (1) that there will be no nuclear war; (2) that prosperity will continue without significant inflation; and (3) that the main objectives of our national housing policy will be the same.

"Under these conditions, sustained economic growth with abundant employment opportunities should be attained.

"As far as the mortgage field is concerned, I see no need to predict any major change in our system of savings institutions—the life insurance companies, savings and loan associations, commercial and savings banks. Evolutionary changes will occur, of course, so that—for example—we could look to the savings accumulated in pension funds to be made available in some manner to the home mortgage field.

"If some instrumentality should prove to be essential to a smooth flow of funds into mortgages, it may be assumed that governmental action would be taken to meet the needs of the nation.

"Here, then, are some long-range projections to think about.

"First, the increase in population of the United States is paramount in projecting into the future. Today our population stands at nearly 180 million people.

"If the experts are correct, the population in the year 2000, will reach a total of about 350 million. I have seen some studies which set a maximum as high as 388 million, based on our present rate of growth, and a minimum of 257 million. The low figure would result if there is a big slowdown soon in our present rate of growth. I go along with the in-between figure of 350 million.

"Secondly, to set the stage for a look at what will be happening when today's 40-year mortgages are maturing, let's look at some figures from which my projections to the year 2000 were derived.

"In a statement prepared for the Joint Economic Committee, Gerhard Colm of the National Planning Assn., in terms of '58 dollars, estimates the Gross National Product for 1959 at 490 billion dollars.

"In 1965, Mr. Colm estimates that our GNP will be 633 billion dollars and by 1970, he predicts it may reach 790 billion dollars.

"The Gross National Product will be an important factor in housing for the year 2000. If Mr. Colm's projection of 790 billion dollars by the year 1970 is accurate, then I believe we can expect that the GNP will reach 1.5 trillion dollars by the turn of the century.

"A trillion and a half dollars is inconceivable to anyone but a mathematician or statistician. But if it were represented in dollar bills laid end to end, it would make a paper pathway from here to the sun and halfway back.

"That is a lot of money. A natural question is what will this mean to the average American family? How will it affect his income?

"Well, today it is estimated that the median family income is about $5,100. In terms of 1956 dollars, we can expect the median family income to rise to about $10,000 annually. . .

"I think you will admit that this indicates a tremendous advancement in the welfare of the American people.

"In 1959 we are the best housed, best fed, and best clothed people on the face of this earth. With a doubled income per family—based on 1956 dollars, mind you—this nation should be experiencing the highest plateau of living ever dreamed of by man.

"With families earning those kinds of incomes, what can we reasonably expect they will be paying for homes in the year 2000?

"Based on the preceding projections, I think that the American families will be wanting considerably better housing than they have today. We know that in 1959, the typical price for a new house is about $13,500.

"I believe that the increase in income will cause families to want to buy homes of better and better quality. They will want bigger and better homes and they will be able to pay for them. The typical house purchased in the year 2000 probably will be in the $20,000 to $25,000 class, as measured in terms of present-day prices. And I am confident that American families who buy those houses will get better value, dollar-for-dollar, than they would for that price house today because of the great advances that are being made in building materials and techniques.

"With $20,000 to $25,000 houses being the median market for $10,000-a-year income families, I believe we can make rather accurate projections on what the housing picture itself will look like 40 years from now.

"Today there are more than 55 million dwelling units in the United States. Of these, more than 30 million are owner-occupied.

"By the end of this century, it can reasonably be assumed that there will be about 115 million units, including vacant and seasonal dwellings.

"About 75 million of these units will be owner-occupied. That will mean more than doubling our inventory of housing units by the year 2000. With obsolescence and replacement to make room for the more expensive houses, the future market for the housing industry is tremendous.

"To occupy those 115 million units, we will have total households in this country doubling those of today.

"The average annual rates of household formation are expected to vary during the next 40 years. They should rise from the current rate of less than one million annually to a level of

1,300,000 for the period 1970 to 1980. Then, our experts believe they will drop slightly during the following decade, and rise again in the period 1990 to 2000.

"With our present number of households totaling more than 51 million, I think it is safe to assume on the basis of 1,600,000 new household formations annually after 1990 that the total will reach 100 million by the year 2000.

"To meet this burgeoning market, the housing industry should be looking forward to major advances in the number of new housing starts before the end of the century.

"We are estimating that this year private, non-farm housing starts will number in excess of 1,300,000 units.

"On the basis of our previous projections of population growth and household formation, I believe we can look forward to total starts, including farm units, numbering between 2¼ and 2½ million units annually by the year 2000.

"With that kind of building activity, and if Mr. Colm's estimates to the Joint Economic Committee are reasonable, then it is conceivable to me that *Fortune* magazine's projections on housing and house furnishings expenditures are in order.

"*Fortune* says these expenditures may reach $108 billion this year; $130 billion by 1965, and $160 to $165 billion by 1970.

"Extending these *Fortune* magazine figures into the year 2000 in line with our other projections, I believe we can suggest a comparable estimate of housing construction and home furnishing expenditures of about $335 billion.

"As we ponder these projections and begin to realize more fully the tremendous opportunity that lies ahead, I think we should again restate the national housing policy. I am convinced that the time is near when *all* American families *are going to be* decently housed. The big question is simply whether private industry will meet this challenge or the federal government will be required to inject itself further into the field. . . ."

ADVERTISEMENT

Membrane fireproofing: a re-examination

For years, membrane fireproofing has been the standard method of attaining low-cost fire protection in floor-ceiling assemblies. For example, where one-hour or two-hour construction was required—and an acoustical ceiling was wanted—most specifications called for mineral fiber acoustical tile cemented to either a lath and plaster or gypsum board membrane. The acoustical ceiling tile alone could not offer rated fire protection to the structural members in the assembly.

acoustical tile offers rated fire protection

Now a new method of membrane fireproofing, Armstrong Acoustical Fire Guard, eliminates the need for intermediate fire protection between the suspended tile ceiling and the structural floor above. Acoustical Fire Guard is the first acoustical ceiling tile to offer rated fire protection to structural steel. Floor-ceiling assemblies using Acoustical Fire Guard as *the only protective element* beneath the structural floor have received one-, two-, and four-hour ratings from Underwriters' Laboratories, Inc.

significant savings in time and cost

Because Acoustical Fire Guard eliminates the need for additional fire protection above the suspended ceiling, it offers significant savings in construction time and cost. It is installed in a completely "dry" operation; there are no delays of the kind caused by "wet" work. This has already enabled many general contractors to save three to six weeks' construction time.

Through elimination of materials and labor, Acoustical Fire Guard can mean savings of up to 30¢ per square foot, depending upon locale, building design, type of fire protection being considered, and type of alternative acoustical ceiling being considered.

There are many instances when Acoustical Fire Guard ceilings will provide greater fire protection than would be the case with alternative methods. In such cases, this additional protection will usually be recognized in the form of lower fire insurance rates—year after year—on the building and its contents.

additional advantages

Acoustical Fire Guard offers unlimited accessibility to pipes, ducts, and electrical fixtures above the acoustical ceiling. Its acoustical efficiency is built in at the factory and does not depend upon the skill of the man who installs it. And it is an interior finish that requires no job painting after it is installed.

Acoustical Fire Guard has been chosen for millions of square feet of fire-retardant ceilings in commercial, institutional, educational, and industrial buildings across the country.

If you would like to learn more about this remarkable new ceiling, contact your Armstrong acoustical contractor or your nearest Armstrong district office. Or write to Armstrong Cork Company, 4201 Ryman Street, Lancaster, Pa.

Circle 104 for further information

AE NEWS

AIA portfolio

Architectural activity in general continues to flourish in most areas of the nation and prospects for the future are excellent according to a review of the situation conducted by the AIA board of directors. There are local variations to this pattern but in general the concensus affirms an active year ahead.

The board of directors has issued a report in which AIA chapters and individual architects are urged "to take the lead in improving our cities by advancing a coordinated approach to planning for community building and rebuilding . . . The decay of our cities is overtaking our limited on-again, off-again renewal efforts. Our national pride, the continuation of our high standard of living and our leadership of the free world demand sound and continuing redevelopment programs based on proper planning and design."

The Architects Council of New York City together with the New York Chapter of the AIA announced their endorsement, with recommendations for certain changes, of the proposed zoning resolution prepared by Voorhees, Walker, Smith and Smith for the City Planning Commission of New York. In commenting on a special 57-page report issued to the metropolitan press, Charles M. Spindler, the Council's president noted that, "In this new and exciting age of jet travel, New York City simply cannot go on living under the horse and buggy zoning enacted in 1916. The City has changed radically since then, and is still changing . . . I therefore call on all dedicated citizens and organizations to join the architectural profession in the effort to secure zoning which answers the needs of the future—not the past."

In discussing the New York AIA Chapter's report, its president, L. Bancel LaFarge, FAIA, declared, "A lot of twaddle is rampant that a new zoning resolution replacing the existing obsolescent code will be a straightjacket for the City. People who believe that—if they really believe it—must by inference consider all regulations and laws as straightjackets! Civilization progresses by means of intelligent regulation of the individual when he comes in conflict with the public good. . . . We are going to fight the good fight to see that this City gets new zoning. Absolute necessity requires it. There is no intelligent way the present 1916 system can be further amended to keep up with the vast changes now demanded of it."

The City Planning Commission made public on December 21, a *Proposed Comprehensive Amendment of the Zoning Resolution of the City of New York*, a 330,000 word document containing 112 pages of text and 131 pages of revised maps. The document is based upon the proposed resolution of Voorhees Walker Smith and Smith. After public hearings in March, the proposal will be submitted to the Board of Estimate for final adoption.

A fellowship offering a stipend of $3,000 for travel abroad was recently announced by the New York Chapter of the Institute. Architects in the New York Metropolitan area are urged to compete for the LeBrun traveling scholarship, established by the will of Napoleon Eugene LeBrun and which has been awarded biennially since 1912. The program and further information may be obtained from Lester D. Tichy, AIA, New York Chapter, AIA, 115 E. 40th St., N.Y. 16.

CEC/NSPE/ACI news

Members of the *Consulting Engineers Council* meeting recently in Cincinnati, Ohio, heard a number of reports dealing with various aspects of professional practice. The practice of engineers stamping so-called "package" or "standardized" designs prepared by manufacturers was slammed by CEC Ethics Committee Chairman, Joe Williamson of St. Louis. According to Williamson, 100 per cent packaged engineering jobs, in particular sewage treatment plants, are finding increased acceptance by municipalities, industries and others. Admitting that packaged plants are perhaps an advance similar to the development of packaged switch gear, Williamson took exception to the practice of engineers charging full fees for such plants.

Another policy statement issued by the CEC board dealt with the subject of "free engineering," stating that: "Charges for professional engineering services should be fully and separately proposed, quoted and invoiced by persons or firms who furnish the services. It is unethical and unprofessional to conceal, lump together, or absorb any part or all of the cost of professional engineering services in the cost of equipment, materials, construction, or non-professional services."

The *National Society of Professional Engineers* states that it will press for a registration requirement in a safety bill re-introduced by Senator Hubert H. Humphrey. When Congress convenes this month, NSPE will again urge an amendment to a pending bill introduced by Senator Humphrey which would create a new Federal Safety Division in the Department of Labor to direct and coordinate all Federal safety educational programs. This bill provides for the appointment of at least ten "qualified safety engineers" to the new Safety Division. NSPE will seek to have the language amended by adding *a requirement that the safety engineers appointed be registered under applicable state engineering laws.* NSPE will point out that there is no better indication of professional qualification and competence than registration as a professional engineer.

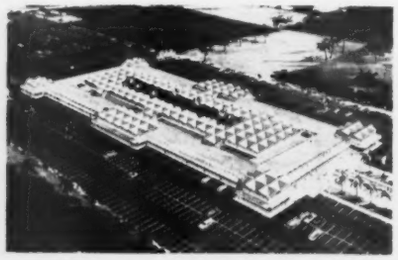
The 56th Annual Convention of the *American Concrete Institute* will be held March 14-17, 1960, at the Commodore Hotel, New York City. Among the technical sessions will be reports of committees on concrete formwork, shear and diagonal tension, recommended practice for slab-on-ground construction, specifications for structural concrete, as well as many other aspects of design and structural research. For further information, Roger H. Corbetta, president, Corbetta Construction Co., New York City, is general chairman for this ACI meeting.

Competitions

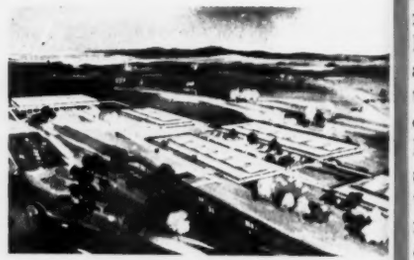
The second $25,000 *Annual Architects' Competition* sponsored by the Mastic Tile Division of the Ruberoid Co. has been announced. This year's program has as its premise, "Education for Youth and Adult—Recreation for All the Family." This theme follows the first competition, "Better Living for the Middle-Income Family," which generated great interest in 1959 and resulted in stimulating new concepts in tract housing. The competition is endorsed by the National Institute for Architectural Education and is ap-

New $667,000 IBM branch office at Santurce, Puerto Rico, features exterior concrete sculptural solar-screen. Building has three floors with a total of 30,000 square feet. On southern side, solar-controlled sunshades automatically close in direct sunlight. Architect: Henry Klumb, AIA, San Juan, P.R.

Aerial view of Loughborough Estate at South London, England. This project, consisting of high-rise blocks up to 11 stories in height, combined with ground level cottages, houses 3,000 people. Recreational, shopping and parking facilities are also provided. (Photo: British Information Services)



The Bazaar International, an international trade center composed of 145 shops located on U.S. Highway #1 at Riviera Beach, Fla., opened this month to provide another attraction to the visitor's agenda. Architect: Alfred Browning Parker, AIA, Structural engineers: Norman J. Dignum Associates.



$4 million research and development complex to be completed in 1960 at Palos Verdes peninsula of Southern California by Nortronics Div., of Northrop Corp. Project will encompass approx. 350,000 sq. ft. of office and laboratory space on 50-acre site. Architect: Charles Luckman Associates of Los Angeles.

proved by the Committee on Competitions of the AIA. It will be open to all registered architects of the U.S.A., architectural assistants to registered architects and students of ACSA accredited schools of architecture. A distinguished jury has been selected and registration information detailing the competition will be directly available from the Mastic Tile Division, The Ruberoid Co., Vails Gate, New York, P.O. Box 128.

West coast report

Lightolier Inc. has announced that it is presently near completion of construction of a new western headquarters, showroom, warehouse and custom factory facility. The project, which represents the most ambitious building program of the company to date, has an area of 21,000 square feet, of which 8,000 square feet will be utilized as a showroom. The new, air-conditioned building was designed by Carl Petrilli, AIA.

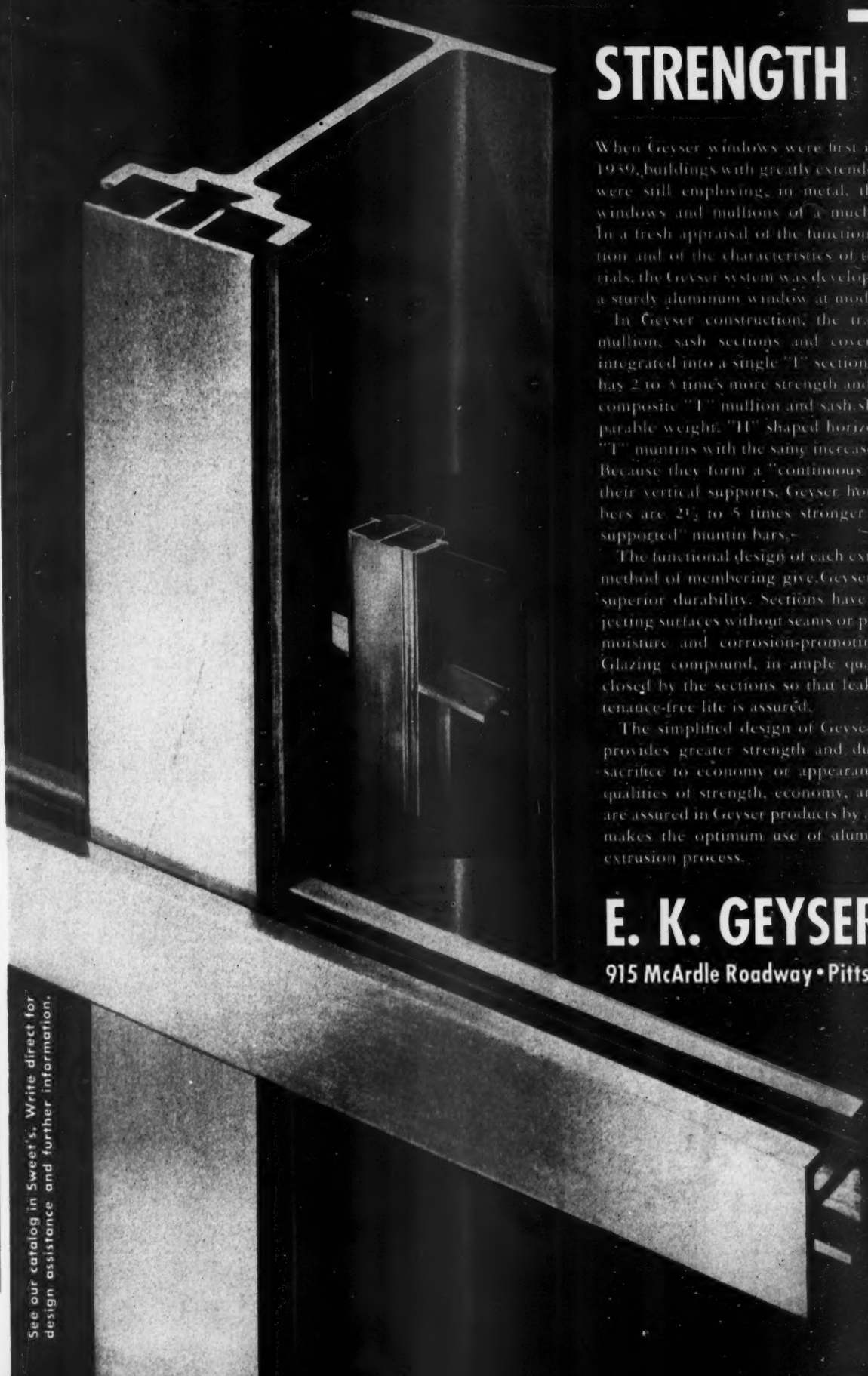
Welton Becket and Associates, Architects and Engineers of Los Angeles, New York and San Francisco, have announced several new projects. Construction is underway on a six-story addition to the south wing of the Hotel Riviera at Las Vegas. The $1.4 million addition will provide the hotel with another 114 guest rooms and suites and a proposed Sky Room which will feature a glass-enclosed "outer space" theme for this cocktail lounge which will be reached by "rocket" elevator in a simulated space flight.

The Becket organization is completing construction of the Thalians Clinic for Children at Mount Sinai Hospital in Los Angeles. This facility provides out-patient psychiatric service for disturbed children to age 18. This fall, construction will begin on a two-story-and-basement reinforced concrete structure to provide expanded facilities for the Santa Barbara, Calif., Police Department. The site of the facility and its functions were determined by the Becket office from a sample survey of 14 cities of comparable size to Santa Barbara throughout the state. This survey pinpointed the detention load that the structure will be required to meet during the coming years. The air-conditioned facility will also provide physical education facilities, a pistol range, closed circuit TV and other electronic communication devices.

Plans for an extensive building program, which will make use of thin-

(Continued on page 8)

GEYSER CURTAIN WALL



STRENGTH +

When Geyser windows were first introduced in 1939, buildings with greatly extended glass areas were still employing, in metal, the same unit windows and mullions of a much earlier day. In a fresh appraisal of the functions of fenestration and of the characteristics of the new materials, the Geyser system was developed to provide a sturdy aluminum window at moderate cost.

In Geyser construction, the traditional "I" mullion, sash sections and covers have been integrated into a single "I" section. This section has 2 to 3 times more strength and rigidity than composite "I" mullion and sash shapes of comparable weight. "H" shaped horizontals replace "T" muntins with the same increase in efficiency. Because they form a "continuous beam" across their vertical supports, Geyser horizontal members are 2½ to 5 times stronger than "simply supported" muntin bars.

The functional design of each extrusion and its method of membering give Geyser construction superior durability. Sections have flat, non-projecting surfaces without seams or pockets to hold moisture and corrosion-promoting impurities. Glazing compound, in ample quantities, is enclosed by the sections so that leak-proof, maintenance-free life is assured.

The simplified design of Geyser construction provides greater strength and durability at no sacrifice to economy or appearance. Combined qualities of strength, economy, and appearance are assured in Geyser products by a design which makes the optimum use of aluminum and the extrusion process.

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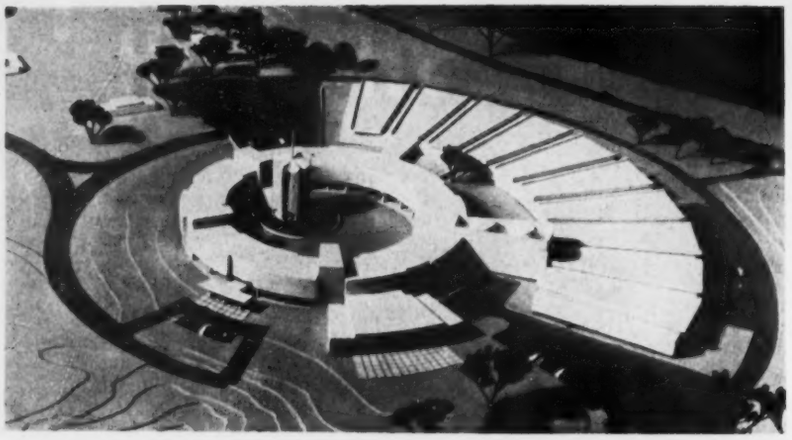
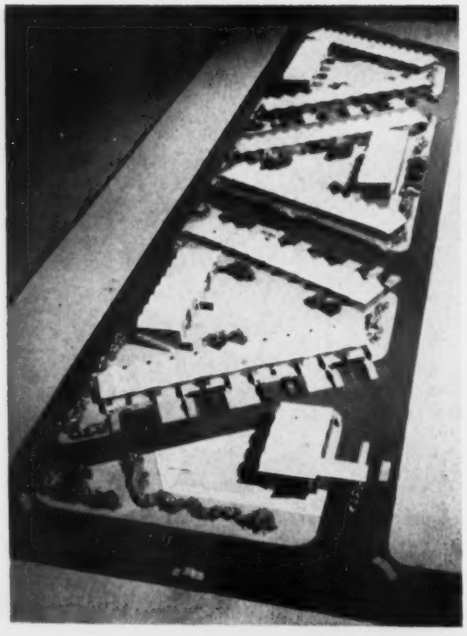


Study model (left) of Valley Forge Headquarters, American Baptist Convention, which has earned for Architect Vincent G. Kling, AIA, the 1959 Award for a Proposed Building of the AIA's Philadelphia Chapter. Another Kling design, the Bryn Athyn Elementary School in Bryn Athyn, Pa., captured the Honor Award in the school category of the chapter's annual architectural exhibit.

AE NEWS

(Continued from page 7)

The Pittsburgh Hilton, the world's first hotel sheathed in gold-anodized aluminum opened to the public last month. The 800 room, 22-story structure utilized 350,000 pounds of aluminum for its curtain wall. Architect: William B. Tabler, AIA and Associates of New York.



Scale model (left) of 10-building apartment project recently completed at Klamath Falls, Oregon. The $498,917 project contains 93 units in combinations of electrically-heated 3 and 4 room furnished and unfurnished apartments. Rentals range from $60 to $95 a month, depending on size and furnishings. Living rooms in each unit measure 12 x 15 feet, and the bedrooms, 8 x 10 and 10 x 12 feet. Cost saving features are use of masonry-insulation fill, exposed masonry interior walls and the use of plywood roofs and arches. Architects: Morrison and Howard of Oregon.

shell concrete, glass, stone and steel have been announced by Dr. Fletcher Harding, Minister of Encino Community Church of Los Angeles. The Becket office has been retained for the $1,355,000 program, which will include three structures: a two-story glass, steel and stone multiple-story fellowship hall; a 60-foot high vaulted thin-shell concrete and stained-chipped glass sanctuary, and a chapel of alternating segments of thin-shell concrete and tinted glass. Also included will be an outdoor seminar-recreation area.

Plans for the construction of a new building in the Brea, Orange County, office of California bank have been announced by Frank L. King, chairman of the bank's board of directors. The new facility, designed by *Charles Luckman Associates*, planning-architecture-engineering firm of Los Angeles and New York, calls for an open-front-type building and drive-up teller window plus ample parking facilities.

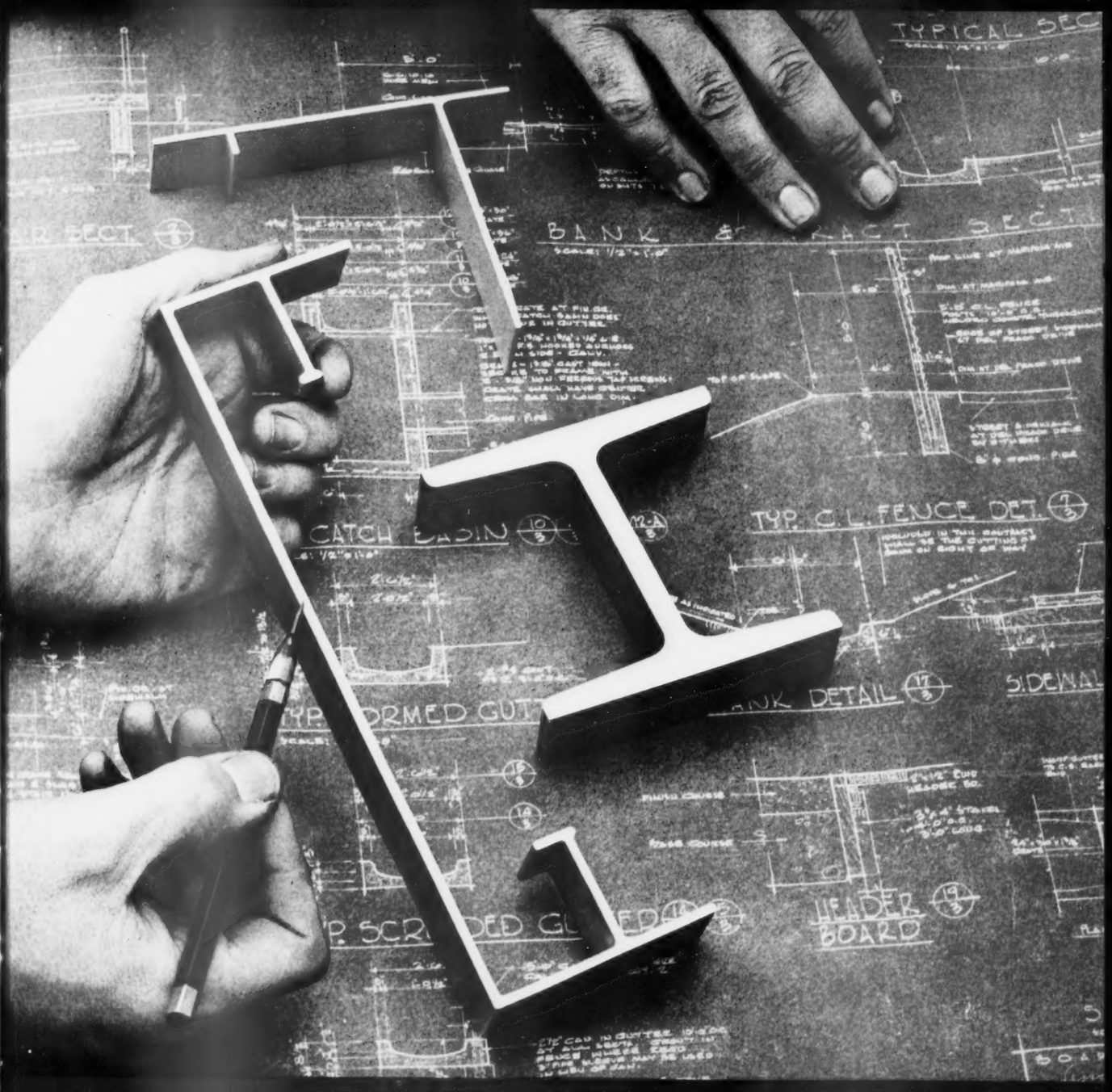
Project roundup

North Shore Congregational Israel, Glencoe, Ill., has confirmed the appointment of Minoru Yamasaki, AIA, Architect of Birmingham, Mich., to design a new sanctuary and religious school addition. In announcing the plans for the new $1.5 million facility, it was stated that Yamasaki will be assisted by Friedman, Alschuler and Sincere of Chicago, as resident architects, and by an advisory committee from the congregation.

The Trane Co., La Crosse, Wis., has announced plans for a new million-dollar plant in Salt Lake City, Utah. The building will occupy an 86-acre site, with about 60,000 square feet plus warehouse facilities, and is scheduled to be in operation within about a year. *Deseret Architects and Engineers* of Salt Lake City have been retained to design the plant.

Completion of financing for New Orleans' largest office building, a 421,000 square foot, 28-story building at 225 Baronne, has been announced by L'Huillier S. Sheaff, president, Cushman and Wakefield, Inc., New York rental and management agent for the building. The financing included what is believed to be the largest single loan of this type ever made in the New Orleans area—a sum in excess of 8.5 million made available by the Metropolitan Life Insurance Co. Plans are now being completed by the firm of *Shaw, Metz and Associates*, Architects of Chicago.

Circle 106 for further information about Kaiser >



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THE DECADE AHEAD

A/E News presents statements of leaders of the professions of architecture and consultant engineering. These gentlemen were asked to view the decade ahead and assess the role that the practitioner would play in American life. An eloquent current running through all of the respondent statements is that of the need for a greater emphasis to be placed by the architect and the engineer for a broader measure of responsibility and participation in civic and public life, both within and without one's profession.

RICHARDS: *"our urban culture is in mortal danger. . ."*

We are moving into the seventh decade of this eventful century with the growing awareness that our urban culture is in mortal danger. The pollution of land, water and air threatens the health of human habitation. Traffic congestion begins to cancel out the advantages of modern transportation. Our impressive advances in securing technological convenience and increased leisure are of no avail as long as we are surrounded by growing ugliness and confusion.

We must dedicate ourselves to the creation of a better physical environment. Optimistic forecasts of unprecedented building activity are not enough unless we gain the understanding that urban renewal and expansion must also be liveable and beautiful. The technician, engineer and politician alone can no longer save us. We need a coordinated approach to the organization of urban space which has become our most precious commodity. This coordination—the integration of technology and humanism in building for people—requires the teamwork of all segments of the building industry under the leadership of the architect who must rise to the challenge of our need for the twentieth century master-builder. He must reunite technology and art under the supremacy of design.

John Noble Richards, FAIA
President
The American Institute of Architects
The Octagon, Washington, D. C.

NEUTRA: *"environmental design —the task of the architect . . . shape versus chaos. . ."*

Sheltering man and his activities is one of the oldest concerns. Today, it is less sheltering against the elements than against man's own explosive inventiveness and his own glorious progresses which, uncoordinated as they are, often militate against what is biologically bearable or humanly tolerable. Cities are proud of becoming crowded with gigantically oversized buildings undreamed of a century ago. They glisten like the metallic herds of automobiles which jam so called freeways and ever-growing and ever-too-small parking places. Environmental design, the task of the architect, will in the next decade concern itself not only with the biological necessities of passengers in a missile to the moon, but with those of a housewife in the kitchen, a child in the nursery, man at all kinds of work and at many kinds of play. Shape versus chaos is one of those biological necessities.

Richard J. Neutra, FAIA
Los Angeles, Calif.

ROOT: *"increasing part of his work devoted to rehabilitation and community and area planning. . ."*

I think that the major challenge facing architects today arises from the problems created by the large scale shift of population into great metropolitan areas, the blight of our city centers, and the hasty and unplanned growth of our suburbs. The role of the architect in the next decade will be largely shaped by his response to this challenge. Urban rehabilitation and regional planning require collaborative effort. No doubt, because of his training, the architect will be called upon to contribute to that effort, and the next decade will see an increasing part of his work devoted to rehabilitation and community and area planning.

John Wellborn Root, FAIA
Holabird & Root, Architects and Engineers
Chicago, Ill.

PEREIRA: *not to be "distracted by the ephemeral excitements of a Brave New World. . ."*

In this era of atomic energy and psychic energizers, it is well for the architect to remember that what is modern today is antique tomorrow and that only man by resisting improvement avoids obsolescence. In the decade to come we shall best serve our profession if we refuse to be distracted by the ephemeral excitements of a Brave New World and continue to devote our

(Continued on page 14)

Circle 106 for further information about Kaiser

efforts to safeguarding the uncertain destiny of the timorous old fashioned worldings we know as human beings.

William L. Pereira, FAIA
Los Angeles, Calif.

EVERETT: *a greater "challenge and opportunity. . ."*

[The] activities of consulting engineers cover such a wide range that it is hard for me to identify them as a single entity. Some consultants are used primarily to provide engineering services to organizations which do not have an engineering department. Others are called in primarily as troubleshooters when the local staff have been unable to solve their problems. Still others serve as contractors to supplement the professional work of well-organized engineering staffs as their load becomes too heavy to handle.

With the increasing emphasis on sophisticated attacks for new engineering problems, it is quite probable that the consulting engineer will become increasingly important. Many organizations cannot themselves support the wide variety of engineering talent that will be necessary to design the systems of the future. This will require that many consulting engineers must be able to handle problems which involve new knowledge in electronics, propulsion, solid-state physics, mathematics, advanced dynamics, etc. There will be a challenge and an opportunity, but also the penalty for failure, which is associated with professional obsolescence.

W. L. Everett, President
Engineers' Council for Professional Development, Urbana, Ill.

BECKET: *architects "by their very natures, leaders in the community—their contribution to civic and public life will be increased even more. . ."*

During the coming decade, architects, and therefore architecture, will not only accept but actively seek an ever increasing role in the civic and public life of our community and nation. As men who plan the communities and homes in which we live, the centers and stores in which we shop, the offices and factories in which we work, the recreational facilities in which we play, and even the hospitals in which we mend, architects are by their very nature leaders in the community. As such, their contribution to civic and public life will be increased even more during the next decade than ever before.

And just as the role of architecture will grow in public life, so will it grow in industry. More than merely rendering a professional service to his client, the architect will be a valued advisor, especially in site selection and economic matters involving land values and probable building costs.

Determination of location, program, type and efficiency of operation of a structure has grown in importance along with esthetic beauty. As architects and engineers, our professional goal is to design buildings of both distinctive beauty *and* maximum efficiency. We design buildings aimed toward the goal of producing income for our clients through increased sales, cost reducing operations or highly saleable space. More and more important is the fact that buildings must be sound investments for clients.

With the ever increasing need for sound economic planning in all types of building projects, during the coming decade we will be a part of public and business life as we have never been before.

Welton Becket, FAIA
Los Angeles, Calif.

HURST: *"greater emphasis on the quality of architecture as art, transcending building. . ."*

In the decade ahead I look for increasing recognition of the nature and value of the architect and his service. Within the profession I expect a greater emphasis on the quality of architecture as art, transcending building. Best work may be expected from offices in which creative collaboration is achieved between land planner, architect, engineer and artist. The scope of service will broaden to engage urban design and planning on the one hand and building technology on the other. Architectural quality is increasingly dependent upon engineered environment within and controlled land use without. Urbanization heightens this dependence. Architectural education will attract good minds, will become increasingly selective, and will assume more responsibility for creative training in the building engineering fields.

Samuel T. Hurst, AIA, Dean
School of Architecture and the Arts
Alabama Polytechnic Institute

KAMPHOEFNER: *"changing factors of an exploding economy. . ."*

The architect in the first four decades of the 20th century was essentially a stylist who added the frosting to the structural cake. A product of the Beaux Arts tradition of façadism, he was superficially trained to monger the eclectic styles, although with proportion, monumentality and taste.

The change to an economy of scarcity, inflation of the dollar and the new emphasis on technology beginning with preparations for World War II, isolated the architect outside the realm of necessity and threatened to relegate him to an excrescence on society. The engineer loomed behind him and questioned his existence.

The first school of modern architecture in America established by Joseph Hudnut at Harvard in 1936, began the frantic change in personality, character, education and attitude of the architect in revolt against stylism. The new architect will be planner, coordinator, consultant, and comprehensive designer—knowledgable in the complexity of the new technology and the changing factors of an exploding economy.

Henry L. Kamphoefner, Dean
School of Design
North Carolina State College
Raleigh, N. C.

DOW: *"architecture will mother all of the arts. . ."*

I am a firm believer in the old idea that architecture is the mother of all the arts. In the next twenty years architecture will nurture many of its children into adulthood and bring as many more new ones into being.

Craftmanship in all fields will be unequaled in any other part of the world. All of our planning will reflect the best natural qualities with the idea of organic design dominating all efforts.

Architecture will mother all of the arts, not for the reason of selfish ambitions, but through the discovery of what the United States is trying to say and saying it with all its heart and soul. This will call for a unity of purpose which will be reflected and amplified by architecture. This purpose, I believe, will be primarily concerned with the process of inspiring creativeness in every individual.

Today mathematical methods dominate our society. Throughout history this has been the necessary technique for handling rapid physical growth. We now see that this is not acceptable to the spiritual human being; nor is it producing the healthiest economic growth. We are beginning to learn that this kind of growth leads up a deadend street. Higher human values are going to have to be our objective because there is no other way to survive spiritually and therefore economically. The expression of these new values will be the architecture of twenty years from now.

Alden B. Dow, FAIA
Midland, Mich.

ROCKWELL: *for making the architectural profession "more the application of an environmental philosophy. . ."*

It appears to me unlikely that the role of the architect or of his profession in the decade ahead will show marked change. This is not to say that the role will not change or that it should not change. In my opinion it should change. The architect should secure recognition for the complex and essential contribution that he now makes to our environment. More recognition should stimulate him to assume greater responsibility, making the profession of architecture less the exercise of a personal esthetic and more the application of an environmental philosophy.

Opposite to this direction is the equal chance of the architect's becoming a technician to the building industry, performing a mechanistic rather than an intellectual function, serving the needs of the real estate developer and commercial entrepreneur rather than our culture.

The architectural profession, however it tends, will continue to produce much that is competent and it will with varying frequency contribute in an inspired manner to a civilized and civilizing environment.

B. L. Rockwell, AIA
Reid Rockwell Banwell & Tarics
Architects & Engineers
San Francisco, Calif.

COLBERT: *"we expect a new consistency of improved performance. . ."*

It is extremely difficult for me, limited as I am by local perspective, to write a statement regarding the role of the architect in the decade ahead. I can only say that as an individual practitioner I am extremely hopeful. It seems to me that in our tense, clut-

tered, and vibrating society the position of the architectural profession must improve. It is the architect, through his interest in total environment, who can best bring order, reason and beauty to the urban complexes we serve. While, as an individual practitioner, I am extremely concerned with the unbelievably low quality of our over-all works in general, I do believe that the first phase of a revolution is just passing and that we may expect a new consistency of improved performance in the decade ahead.

I believe that the areas requiring greatest architectural attention include a better understanding of the entrepreneurial process, greater acceptance of design standards associated with the broad factors of urban growth, and the psychological effect of environment on people. To single out any limiting factors such as these is difficult, but if one must give an area of prime concern for the decade ahead, I would suggest that it is a better understanding of subliminal associations with physical things. The automobile, representing an increased tempo in our way of life, certainly emphasizes the need for a restudy of architecture both externally and internally.

Architecture like government is the result of the electorate or the clientele. In my mind the situation of architecture must improve in the decade ahead.

Charles R. Colbert, AIA
Colbert & Lowrey & Associates
New Orleans, La.

SAMBORN: *"tenacity and strength of purpose of the consultant. . ."*

The past 25 years of engineering progress has been phenomenal; dreams of then are realizations of now. Much of this advancement has been due to the tenacity and strength of purpose of the consultant who, by the virtue of his "breed," can be either direct, or go off on a tangent which may lead to fantastic ends.

Due to presently new and seemingly "impossible" ideas and conceptions of energy, the next decade will produce more and more wonders, and again the consultant engineer must and will step into the limelight. In this next period, the roll of the consulting engineer will be much more extensive, more specialized and more closely related to urgent public needs.

Much of what these dedicated men can do hinges on several issues, including a better understanding by the general public on the role played by an engineer, as well as close cooperative relation between all elements of the design profession.

Alfred H. Samborn, PE, Chairman
NSPE Section for Consulting Engineers in Private Practice
Toledo, Ohio

HENNESSY: *for "greater participation in government and civic activities. . ."*

It is my hope that the consulting engineer in the next decade will become an active participant in the non-engineering phases of American life; that he will participate more actively and aggressively in government and other civic activities. The normal expansion of engineering development will enlarge his activities in technical fields; the unbalance that exists as contrasted to other professions, lies in the non-technical areas.

John F. Hennessy, PE
Syska & Hennessy, Inc.,
Consulting Engineers,
New York, N. Y.

ROE: *"the engineer and architect, in their joint efforts, are the builders of our world of tomorrow—a sturdier, esthetically more satisfying world. . ."*

If there is one thing which distinguishes the engineer or architect from the other professions, it is lack of recognition. The general public knows what the doctor does, or the lawyer. But ask about the work of an engineer or architect, and you realize how little we have done to make our efforts understood and appreciated.

In a way, Russia's sputnik and subsequent space achievements have been like a wake-up pill. Suddenly, the scientist, the engineer, the architect are "men of distinction," because on them falls the burden of catching up, of keeping our country the leader we have always believed it to be. Last year, there was a great awakening to the fact that these men are not merely designers of "fancy houses." This year may well be the one in which the public begins to realize that the engineer and architect, in their joint efforts, are the builders of our world of tomorrow—a sturdier, esthetically more satisfying world.

Kenneth A. Roe, PE, Executive Vice-president, Burns and Roe, Inc.
Consulting Engineers,
New York, N. Y.

ALEXANDER: *"consulting engineers invaluable to the future health of the . . . industrial scene . . ."*

The consulting engineer and his profession perform an uniquely important function in American life today. Furthermore, this function will become of ever increasing importance over the next decade as competition, already severe from new and existing firms and from new products, is intensified by manufacturers from abroad. Recovery from the effects of World War II has been accompanied by improved manufacturing methods and manpower utilization in many areas abroad. This factor plus the lower cost of skilled labor in other lands tends to put the U. S. manufacturer at a serious competitive disadvantage.

As a result the manufacturers who survive and prosper will be those who have intelligently utilized the best available techniques in every aspect of their operations.

It is uneconomic for most large and for all small companies to maintain on their permanent staff the best available talent to check on the operation of all parts of their far flung operations.

Consequently, the availability of many consulting engineers severally expert in the various aspects of manufacturing is invaluable to the future health of the North American industrial scene.

William T. Alexander, Dean
College of Engineering
Northeastern University
Boston, Mass.

HAINES: *"public's awareness of the architectural profession will increase greatly. . ."*

The public's awareness of the architectural profession will increase greatly in the decade ahead. This recognition, and its attendant responsibilities, will occur as it becomes apparent that key solutions to many of our most pressing sociological problems lie in large-scale community planning of all types—residential, educational, commercial, industrial and recreational. Property values, the automobile, and the accelerant growth of suburban areas and de-emphasis of urban centers are inseparable factors which in the last twenty years have had a bewildering impact on the nation. The need to continually examine these factors and their relationships to each other on a long-range basis, will consequently create a strong alliance between the profession and the practitioners of the social sciences. Although impressive advances can be expected in the technology of building, they will acquire significance only in their application to the problems of the community.

Charles Haines, AIA
Voorhees Walker Smith Smith & Haines, Architects
New York, N. Y.

ANSHEN: *"unique opportunity for the architect . . . to seek endlessly to span the ever widening gaps between art and technology, humanity and science. . ."*

The architect's impact on the decade ahead will, in our opinion, be greater than that in the decade just passed because of the increasing recognition of the public and various government agencies. The architect is practically the one man left with an over-all view of the entire problem of building, urban renewal, suburban growth, problems of transit, both highway and rapid, in other words, all of the problems of a complex, civilized group of communities which make up the entire country.

The architect and the public he serves will be particularly helped in the next decade by the rapidly increasing skill and technological advancement now going forward in this country. New materials, better materials, longer lasting materials, with lower maintenance and cost are being continuously developed so that the end product, whether a building or highway, a vehicle or a cup, can be made more skillfully with better design in order to serve the public in a better and more comprehensive way in the next decade than in the last one.

A unique opportunity for the architect, and an increasing need of society, involves his unusual situation wherein the requirements of his profession cause him to seek endlessly to span the ever widening gaps between art and technology, humanity and science. In a world of ever-increasing specialization wherein the narrow ethos of the balance sheet, the computor, and the scientific formula threaten to crowd out the less exact human and spiritual values, it is a major obligation of the architect to find and express in his work a synthesis of these diverging trends.

Robert Anshen, AIA
Anshen & Allen, Architects
San Francisco, Calif.

technology

& techniques

a sampling

of

1960

We begin a new year of publishing and the second volume of A/E NEWS. In the twelve months which lie ahead, we shall bring to you reports of new methods, materials and systems of construction whose impact will be reflected in architectural and consultant engineering practice. A/E NEWS presents a brief sampling at random of some of the technology and techniques that foreshadow the developments of 1960.

Sample 1:
engineered t&g joint
compression cross-bridging
Sample 2:
light-source advances ac/lighting combined
Sample 3:
bonded panel joint buildings
load-bearing
molded structures
Sample 4:
small steel arches
Sample 5:
burning through concrete

SAMPLE 1/ engineered t&g joint

The plywood industry has introduced a refinement to its single layer combination subfloor-underlayment idea which should save 12 man hours per 1,000 square feet of floor area compared with conventional 2x8 joist construction.

It is an engineered tongue-and-groove joint for *2.4.1*—the 1⅛" fir plywood subflooring grade designed to function as both subfloor and underlayment on supports four feet on centers. Standard panels of *2.4.1* require 2x4 blocking under panel edges. The new tongue-and-groove panels eliminate the need for blocking.

The joint, pioneered by a lumber company, was tested under laboratory conditions for structural adequacy by the research division of the Douglas Fir Plywood Assn. Field tests of the concept were conducted with six builders.

Many advantages claimed

The association states that a number of mills will produce the new panel. DFPA claims these advantages:

1. Further cost savings over standard panels of *2.4.1* and even more savings compared with other floor systems.
2. Sharp reduction in number of individual pieces needed to be handled in a floor. (Example: in a simple 24x48 floor, conventional flooring requires a minimum of 290 separate pieces before the finish can be applied.) Regular *2.4.1*, with blocking, takes 124 pieces, but the new tongue-and-groove *2.4.1* cuts this to only 64. In addition, nailing is substantially reduced.
3. A clean, uncluttered visual effect in the ceiling where the system is used in basement homes.
4. Lower subcontract costs provided by easier access to the crawl space.
5. Far less tendency for joints to "telegraph" through resilient floors.

When *2.4.1* was originally introduced, one builder on the West coast insisted he saved $500, much of it contingent on the lower height of the entire house afforded by "pocketing" girders into the footings. Although many other builders argued the figure was too high, they achieved some economies and the combination subfloor-underlayment idea has been used regardless of cost variations.

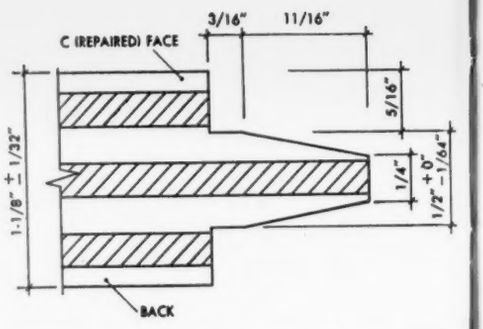
Pinpointing costs

According to John Hess, DFPA's technical director, it is extremely difficult to pinpoint the specific cost savings the new panel produces.

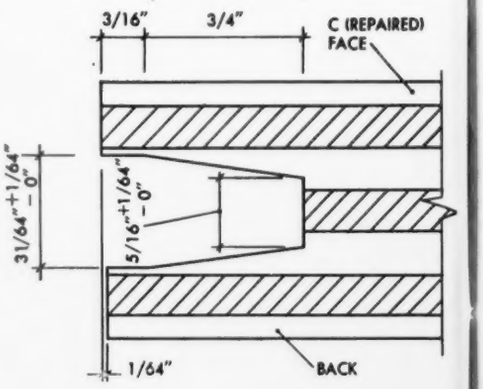
"In the field tests, every application showed savings," he said, "but some builders claimed economies far above those of others. Where detailed costs are available, a typical job appears to produce savings in basic floor construction exclusive of the finish floor of 5 to 10 per cent."

Special joint needed

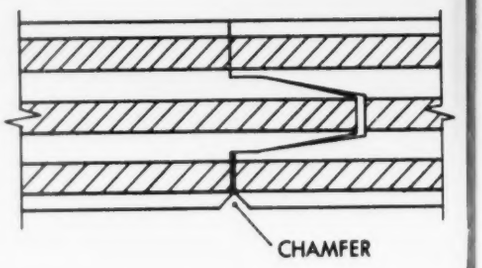
Hess emphasizes that the close-tolerance,



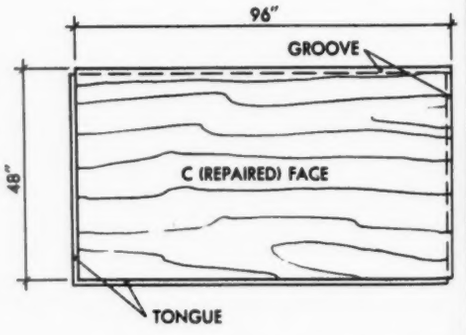
Sample 1: figure 1: tongue detail



Sample 1: figure 2: groove detail



Sample 1: figure 3: alternate joint detail



Sample 1: figure 4: plan view of panel

TONGUE AND GROOVE JOINT FOR 2.4.1

Sample 1: figure 5: Engineered tongue-and-groove joint as shown in details makes possible elimination of blocking on 2.4.1 floor systems. Twenty-three man hours were cut from this project by use of plywood combination subfloor and underlayment that requires no blocking and goes down over beams four feet on center. Big panels are designed to provide a smooth, solid floor and uncluttered support system making possible a finished basement ceiling.

shaped joint is necessary to develop sufficient strength for general purpose residential floor construction.

"Some builders have tongue-and-grooved their own panels," Hess says, "but we've never tested a conventional T&G joint in this application that was permanently satisfactory for a floor."

"The joint is engineered to minimize differential deflection between panels under traffic, so as to protect the thin finish flooring used by so many builders. Load tests show the floor will take concentrated loads up to 1.5 kips. This means that you can position heavy appliances like hot water heaters or furniture like a grand piano any place on the floor with no significant deflection."

Accuracy and tolerances in machining the tongue-and-groove will be subject to the same high standards of quality control DFPA applies to grading of veneer and durability of the glueline.

Testing and developing were concluded this fall after two years of work. Hess said he believes sufficient data has been accumulated now to seek FHA and Building Code acceptance.

David R. Countryman, chief of DFPA applied research section, states that the ultimate development of this idea is a floor system designed to utilize fir plywood box beams as the basic supports, light enough for one man to handle. This should eliminate twisting, shrinkage and nail popping. It will overcome availability problems with solid wood girders, and the beams themselves may well be cheaper than conventional supports.

SAMPLE 1/ compression cross bridging

A new type of compression cross bridging which eliminates completely the need for nails is reported to save up to 80 per cent in labor costs.

(Continued on page 18)

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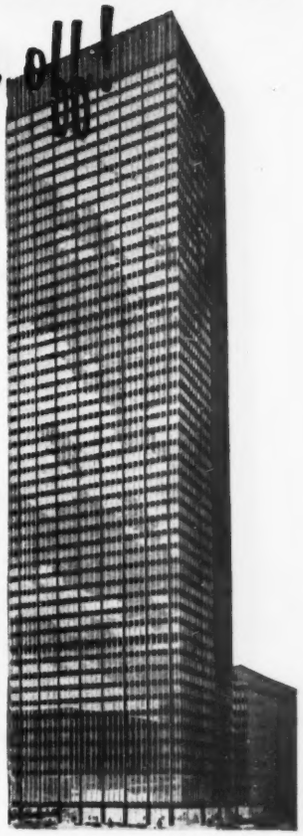

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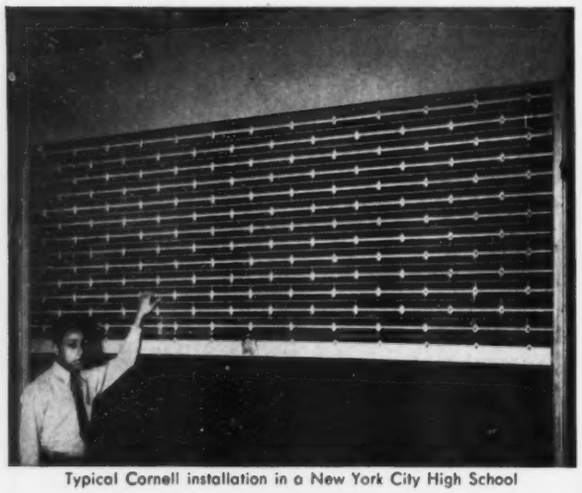

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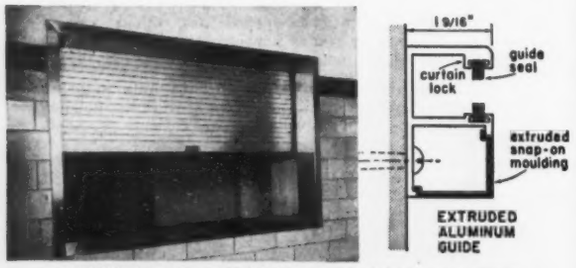

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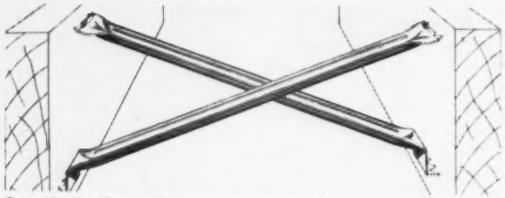
(Continued from page 17)

Through the use of specially designed projections, the new bridging is easily and quickly installed with a few taps of a hammer. A uniquely designed "lazy nail" projection grips wood fibers of the joist so that no nails are required to hold the device in place. Unlike conventional forms of bridging, the unit can be installed in one operation after the subfloor is down. The bridging is made of 18 gauge corrosion resistant galvanized steel, 1⅛" wide and provided with a ribbed "V" section for extra strength. Three sizes are currently available to accommodate 2x8, 2x10 and 2x12 wood joists on 16 inch centers. This device has been introduced by the Timber Engineering Co. of Washington, D. C.



Sample 1: figure 6: a new compression type cross-bridging which eliminates completely the need for nails.

SAMPLE 2/ light-source advances

A new high-brightness grooved fluorescent lamp that increases light output by 15 per cent, and efficacy (or economy of operation) by 8 per cent over earlier types, was reported in one of several technical papers presented recently at the annual technical conference of the *Illuminating Engineering Society* in San Francisco.

The new lamp has shallower grooves than models introduced in the past three years, and more of them. As a result of the new design, thinner glass is used for the lamp walls, resulting in a 25 per cent decrease in weight without sacrifice of strength, according to J. O. Aicher and E. Memmers of Cleveland, Ohio, authors of the report.

Describe 96-inch tube

Describing a 96-inch lamp, the two engineers claimed it produces 15,000 lumens at 70 lumens per watt when mounted horizontally (at 77° F in still air) and when its mercury vapor pressure is stabilized. Stabilization, the authors explained, is obtained through control areas in two grooves near the center of the lamp.

Another study of high-brightness fluorescent light sources showed that helium-argon lamps, loaded at 25 watts per foot (96-inch lamp at 200 watts), provide a 7 per cent increase in mean lumens over similar lamps using neon-argon gas, and even larger increases in an experimental lamp loaded at 50 watts per foot.

Effect of reflectors reported

C. J. Bernier of Salem, Mass., also reported in his paper that the heavily loaded fluorescents have created new interest in the control of light with the use of reflectors. Where it is desirable to project a pattern of uniform light to maximum distances, tests have shown that one heavily loaded fluorescent tube in a controlled reflector is often more effective than several lamps packed together, he said.

Mercury discharge lamps have also benefited from many modifications developed in lighting laboratories in recent months, according to reports delivered at the IES technical conference.

New mercury lamp

In papers describing new designs revitalizing mercury lamps and increasing their usefulness, W. S. Till and M. C. Unglert of Bloomfield, N. J., and E. C. Martt, K. Gottschalk and A. C. Green of Cleveland, Ohio, demonstrated a new electrode design and new type of oxide emission material. Together, these improvements, according to the reports, have resulted in "greatly improved maintenance in mercury discharge lamps, giving them the best maintained light output throughout the life of any vapor lamps, including fluorescent tubes . . ." The new electrodes also result in less blackening of the tube with use. Also lamps with new electrode reportedly start considerably more readily than the older type mercury lamps.

In the opinion of Till and Unglert, the new mercury lamp replies to the threat of high-output fluorescents in industrial and street-lighting applications.

"It is apparent that the lowest cost of light is to be obtained with these new mercury lamps," they declared.

The new version of mercury lamps rated at 6,000-7,000 hours of economic life, as a result of the new electrode, are now rated at 9,000 hours of economic life and save approximately 18 per cent of the annual cost of light, depending on the type of installation, the engineers reported. Average life to burnout actually far exceeds the rated life, a fact that applies broadly in the lighting industry.

The American Standards Assn. has assigned the classification "33" to identify the 400-watt mercury lamps having the new electrode. All new lamps with this identification, the engineers reported, are made with a new hard glass envelope which resists thermal shock and attack by corrosive gases in the atmosphere.

Incandescent studies continue

Despite the persistent popularity growth of fluorescent and mercury light sources in recent years, interest in developing new qualities in incandescent lamps has also persisted. The latest experiments with rhenium, the rare chemical element, as an incandescent light source in lieu of tungsten, were reported by Wilfred G. Matheson, another engineer from Salem, Mass. Studies have not yet produced practical results, and further research and development are needed, the lighting scientist said. While rhenium shows an increase in life up to four times that of tungsten in some applications, working the metal—which hardens faster than any other metal—and drawing it into wire are difficult and expensive processes.

A new development in incandescent lighting that has been put to practical use, however, is a silica-coated bulb with the coating applied electrostatically to produce greater diffusion, thus eliminating "hot spots" and to provide readily for the application of color. Nicholas J. Rainone of Bloomfield, N. J., who reported on the process, showed that the electrostatically applied coating results in a slightly greater transmission of light than other silica-coating processes and is as effective on clear glass as on inside-frosted bulbs.

Silica-coating in general has been shown to reduce the brightness level to approximately one-fourth that of acid-etched, inside-frosted lamps. It also avoids weakening the glass envelope as acid-etching does, according to Rainone.

Flat sandwich of light

Electroluminescent lamps, which develop a flat "sandwich" of light by electrical activation of a coating of phosphor spread between two thin layers of glass of related substance, also were given close attention in reports at the IES conference.

Electroluminescence, it was agreed, is not yet ready for general room illumination, but it is no longer a laboratory novelty. This new light source has been employed for lighting signs and the system will be also used as dashboard lighting in a line of 1960 automobiles, according to a recent announcement.

Reports on phosphor studies

Henry F. Ivey of Bloomfield, N. J., reviewed the findings of lighting scientists, including himself, regarding the significance of the size of phosphor particles on electroluminescent lamp performance, and the use of phosphor-coated strips of film instead of phosphor powders embedded in glass or other media. He reported that the use of large particles of phosphor, a procedure heightening efficiency in fluorescent lamps, does not apply to electroluminescent lamps. Small phosphor particles are superior in these types of lamps. But studies have shown, he continues, "that the maintenance is much worse for the smaller particles. In practice, therefore, it is necessary to effect a compromise between efficiency and maintenance in choosing the phosphor particle to be used in electroluminescence."

Possible applications

He also described experimental electroluminescent lamps with sub-divided electrodes. A seven-section electrode, with suitable switching means, is sufficient to form any number from zero through nine. A ten-segment design improves legibility, he reported.

"In addition to numbers, this lamp can also display 16 letters of the alphabet and many symbols, including positive and negative signs. A 14-segment design permits display of all the numerals, letters and additional symbols. . . . Such display lamps should find application in digital volt-

(Continued on page 20)

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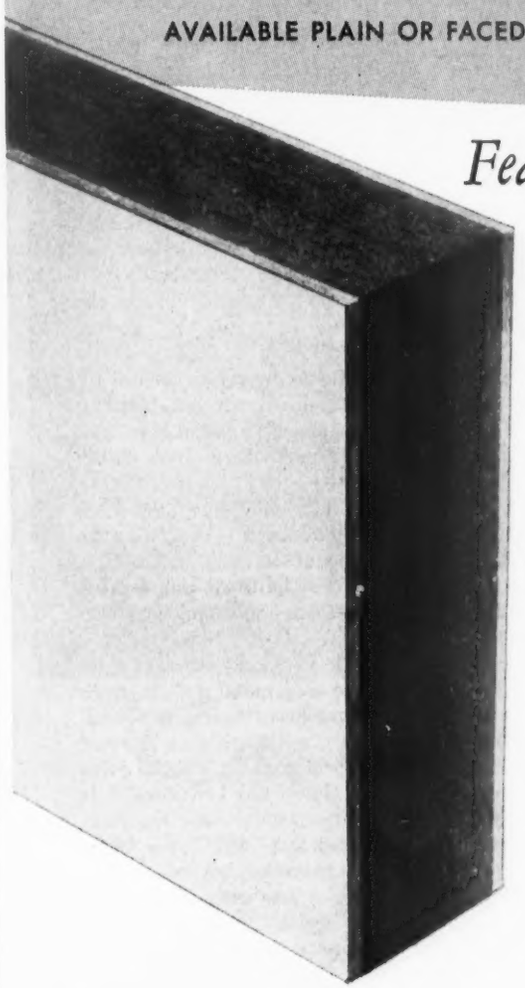

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(Continued from page 19)

meters, computer readout devices, stock-quotation boards, athletic scoreboards, train or plane indicators, etc. For such uses, electroluminescence has many advantages over the incandescent or glow-discharge lamps and electro-mechanical devices now used . . ."

SAMPLE 2/ a/c lighting combined

The prospect of combining lighting with some aspects of air-conditioning—space heating as well as space cooling—in business and industrial buildings grew sharper at the recent annual technical conference of the *Illuminating Engineering Society.*

W. S. Fisher and J. E. Flynn of Cleveland, Ohio, demonstrated an electric lighting troffer which carried heat away from high-footcandle lighting before it could enter the space being lighted and aircooled. In winter, the troffer could direct the lamp heat into the working area to supplement or replace the heating system.

The application of the troffer, the engineers pointed out in their technical paper, is key to the new lighting practices published by IES which recommend increases in the level of lighting for many specific business and industrial seeing tasks.

"Many current examples of lighting in commercial and industrial areas testify that 100, 200 and 400 footcandles are often desirable and economical to provide," the engineers reported. They pointed out, at the same time, that all electric light sources produce heat in addition to light and that heat build-up in a luminaire "may become substantial."

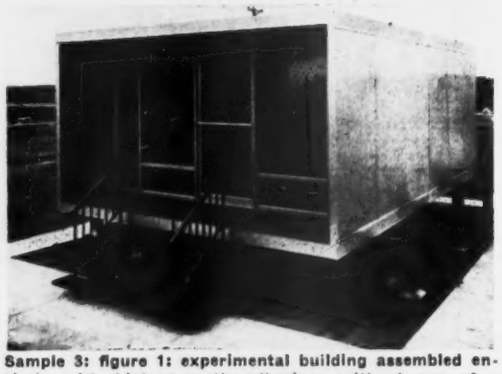
Test equipment described

"Much of this heat can be removed from the luminaire by cooling," they added. "If the luminaire heat is removed to the outside before it enters the occupied space, substantial reductions in air-conditioning tonnage and air-handling can be realized."

The engineers described test equipment for handling lighting heat by exhausting room air through the luminaires, thus carrying heat away before it affects room comfort. Studies indicated that, under specifically controlled circumstances, about 40 per cent of total lighting heat was removed.

Planning modules, five feet square, which integrate lighting and air-handling functions within a single flush mounted element at the center of each module, also were described at the meeting by two engineers from St. Louis.

The modules meet "a rapidly advancing architectural trend toward greater freedom in space planning," according to M. L. Quin and W. W. Kennedy, the reporting engineers. Any multiple of modules, they pointed out, may be combined to produce "a complete luminous, thermal and acoustical environment within a resulting space expansion."



Sample 3: figure 1: experimental building assembled entirely with high-strength adhesives without use of a single structural fastener.

SAMPLE 3/ bonded panel joint buildings

A building in St. Paul, Minn., that was put together entirely with high-strength adhesives or tapes, without the use of a single structural nail, bolt, screw or "point fastener" of any kind, was described at the recent *Building Research Institute* conference on sandwich panel design.

Speaking before architects, engineers, builders, manufacturers of building products and researchers at the BRI meeting, Paul H. Wilson of St. Paul, detailed the processes behind the construction.

The experimental building, 16 x 24 feet and 8 feet high was erected by a laboratory technician as foreman, and two carpenters with engineering supervision. New experimental adhesive films were used throughout the structure. Some joints were actually made in the rain although the core material of every aluminum panel in the building is paper. Exclusive of foundations, the structure weighs less than 1,000 pounds.

Wilson said that the test building was erected to resolve as many questions about bonded structure "as we could squeeze into one building."

"Some features of the jointing system are obvious," he added. "There is no metal path through the wall, reducing thermal loss; there are no supporting extrusions, yet the little I-beam formed by the bond makes a rigid support for the joint area; it is adaptable to almost any type core, it is inherently simple and inexpensive, and the joint is sealed as it is assembled. Peel-type joints readily adapt to field fabrication without expensive jigs."

The building is being heated during this winter and, considering Minnesota weather conditions, Wilson pointed out that this should produce some interesting test results.

SAMPLE 3/ load-bearing molded structures

Inexpensive homes of the future may be built of prefabricated panels containing their own built-in insulation, utility and heating-cooling lines, and so light in weight that they could simply be clipped together in a matter of hours.

The panels may become so versatile and easy to assemble that the homeowner would have the advantage of changing his room layout almost at will, with the basic exterior shape or design limited only by dimensions and the shape of the permanent house foundation.

These load-bearing construction panels are built in such a manner that they appear fantastic the first time one sees the operation. In a space between two sheets of virtually any rigid material selected as outer surfaces of the panel, two or more chemicals are poured together, often accompanied by a "blowing agent" such as fluorinated hydrocarbons—similar to the cold making chemical in home refrigerators. As they combine, these chemicals immediately begin producing a dense foam, one type of which is called urethane foam, which builds up to the point of filling the entire inner area of the panel. As the foam hardens, it becomes structurally rigid and strong, and also serves as an adhesive, bonding the surface "skin" tightly to the unit.

The new construction technique is more than an idle dream in the mind of one builder on the West coast. He has already constructed two test houses which, while not the clipped-together type, have indicated several possibilities for the foamed shapes.

The first test houses were a slight departure from conventional construction in that simple prefabricated steel supports replaced a system of wood framing. To these supports were buttoned the foamed modular panels. Plans cited for producing lightweight molded structures that are to be air-lifted by helicopters to off-shore petroleum drilling sites, is an indication of the adaptability of prefabricated wall panels to meet any house construction or design requirement. The only limitations it seems are the design conditions that must be fulfilled.

In exterior panels, complete walls, offering a variety of window and door shapes, sizes and positions may be developed. Their basic core will be a two-and-a-half or three inch thickness of foamed material such as urethane that combines both heat and acoustic insulation with strength and rigidity. The outer surface of a panel could be any desired type of exterior wall material, such as weatherboard, shingles, metal sheathing or plastic film. Interior surfaces could be a tough, durable, stain resistant, plain or textured surface material such as polyester films. In fact, it is reported that one might well be able to select the basic panel with exactly the type, color and textured wall covering to complete an interior design scheme.

Plumbing and electrical lines may be molded right into the wall panels, and so designed that when the panels butt up against each other, the connection will automatically be made. In this way, all utility lines would be ready for use as soon as the walls are assembled. They would also match up no matter how many times the walls were unclipped to change the basic house arrangement.

Where year-round air-conditioning is desired, all windows could be molded permanently in place in the panels, providing a wall structure that is perfectly insulated. Wall panels could be stand-

ardized in size, thereby permitting their interchangeability. This could make possible a system of "trade-ins" of one wall panel for another style.

An important ingredient of the foamed structural materials is the use of the fluorinated hydrocarbons as a "blowing agent"—a nonflammable, nontoxic gas that will, when incorporated in the foam mixtures, expand and develop a cellular structure that may provide either rigid or resilient material. These chemicals, entrapped in the cell structure also act as an insulator that is stated to be more effective than other currently available insulation such as glass fiber, cork, or expanded polystyrene. This report originates with the Product Information Service of the E. I. du-Pont de Nemours & Co., Wilmington, Del.

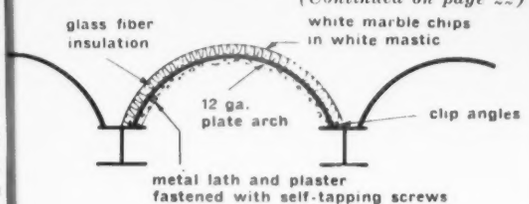
SAMPLE 4/ small steel arches

Architects for the Carrousel Motel in Cincinnati, Ohio, provided one of its new buildings with a roof line of identical small arches.

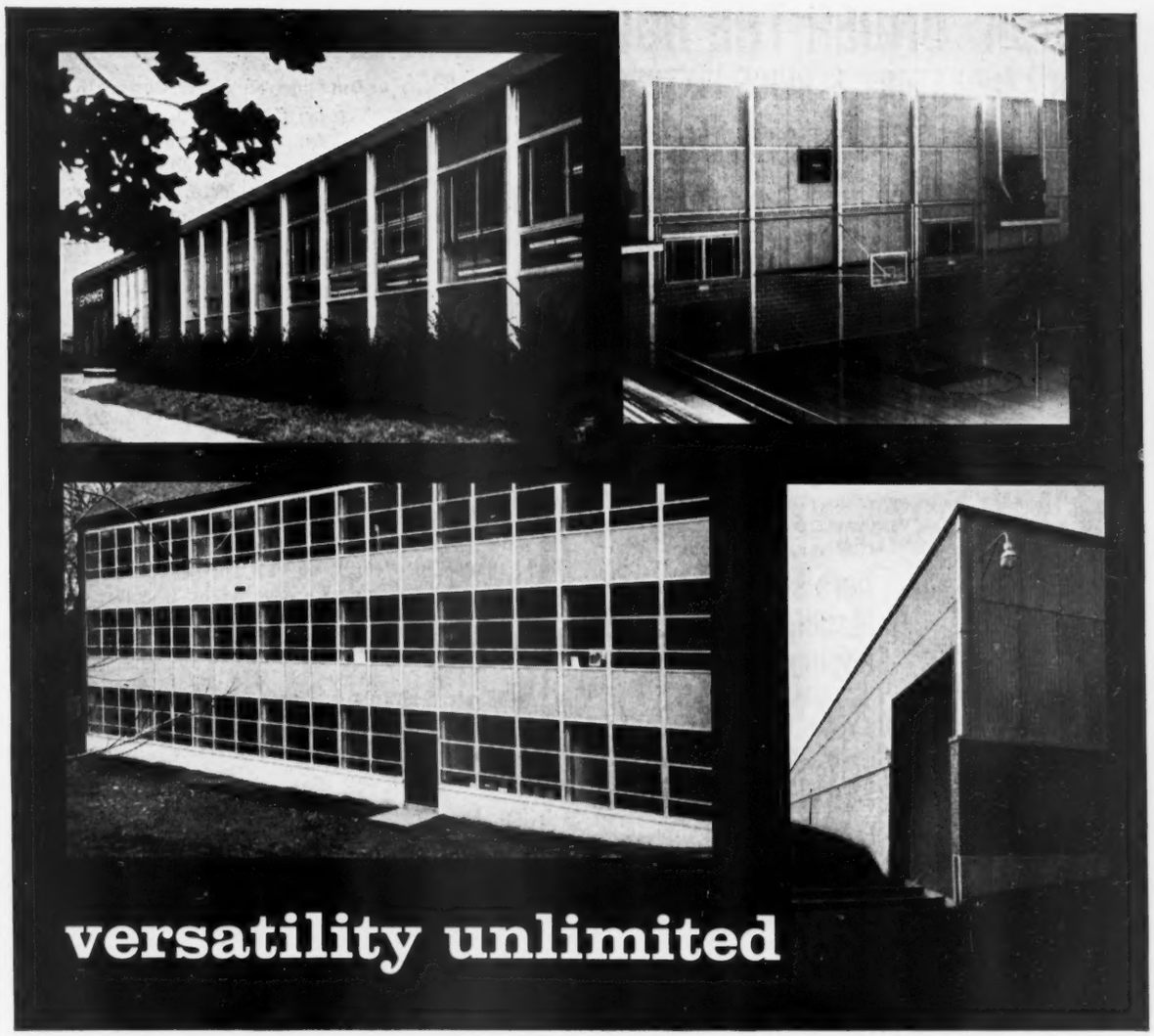
The basic structure of the arch was the use of corrugated 12 gauge metal plates normally identified with storm water drainage installation. According to Donald Pansiera of the Cincinnati architectural firm of Pansiera and Dohme, designers of the motel, the choice of the corrugated metal arches was made for three reasons: (1) speed of erection (two days); (2) elimination of shoring, thereby eliminating time for concrete to set up before wrecking forms; and (3) the cost compared very favorably or was no greater than other possible methods.

The plaster adheres to the underside of the metal arch by means of metal lath, attached by sheet metal screws. On top, a layer of glass fiber insulation is placed, plus a white mastic into which white marble chips are embedded.

(Continued on page 22)


glass fiber insulation
white marble chips in white mastic
12 ga. plate arch
clip angles
metal lath and plaster fastened with self-tapping screws

Sample 4: figure 1: section through arch assembly (above) demonstrates use of 12 ga. metal plates. Figure 2 (below) exterior view of finished arch assembly as used on Carrousel Motel in Cincinnati. Architects: Pansiera and Dohme of Cincinnati, Ohio.



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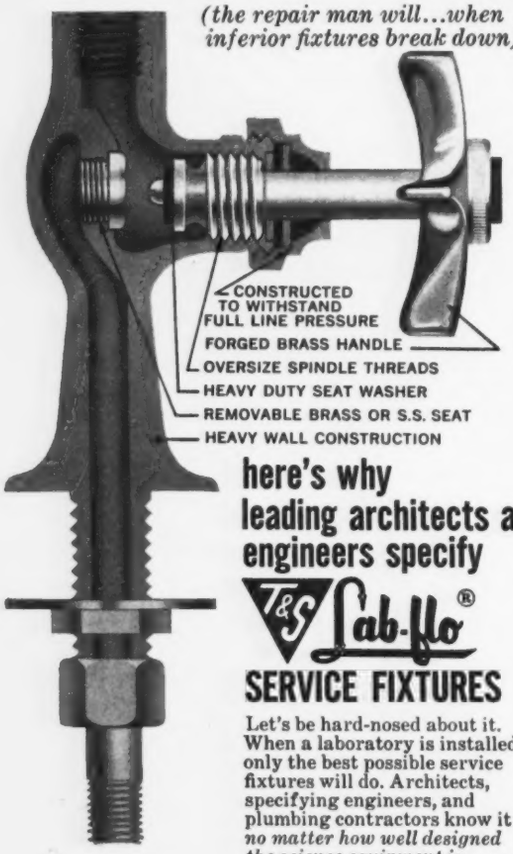
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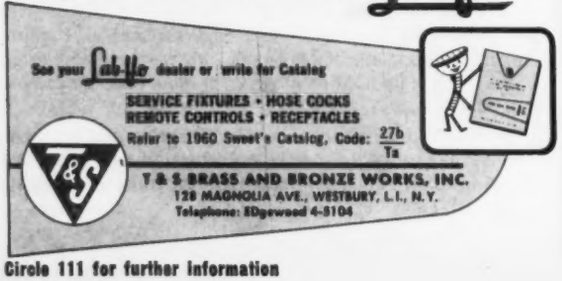
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T&T: 1960

(Continued from page 21)

*SAMPLE 5/***Burning Through Concrete**

Endicott, N. Y., was the scene of the formal introduction of a new tool, which is considered quite revolutionary, known as a powder lance. This development is capable of cutting through concrete, metal or *any* other known hard material of *any* thickness. Materials that were formerly difficult or impossible to pierce with other methods can be pierced and cut with comparative ease and speed by powder-lancing.

Its use at Endicott near the Vestal Ave. bridge over the Susquehanna River was to burn through two 18-inch thick reinforced concrete flood walls as part of a demolition job on the local flood control program. The job involved the removal of the two 17-foot high flood walls. Two vertical cuts were made in each of the two sections that were to be removed. A hole was then pierced in each of the resulting sections slated for removal so that cables could be run through the concrete. As each section was secured by a crane, a horizontal cut was made across the base of the secured section permitting the crane to lift it away.

High cutting speed

The estimated cutting speed through the 18-inch thick concrete was approximately two to three lineal feet per hour. With the new lance, it was also possible to pierce a hole through the 18-inch thick wall in two minutes and 30 seconds or a speed of better than seven inches per minute.

Accurate control of intense heat is the key to the operation of the new powder lance. Lengths of standard black iron pipe are fitted into the front end of the unit, which is connected to an oxygen supply and a specially developed source of metallic powder mixture. The oxygen and metallic powder are mixed in the pipe and carried to the material being pierced or cut by the consumable pipe. This mixture is ignited at the end of the iron pipe, producing an extremely high-temperature reaction, estimated at approximately 8,000° F that melts both the ferrous and nonferrous materials in its path. On materials such as concrete, a recently introduced special mixture of iron and aluminum powder is used. Aluminum powder added to the metallic powder further intensifies the cutting reaction making it possible to slice through thick concrete.

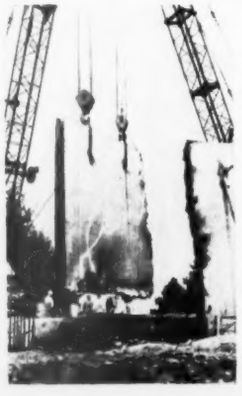
Widespread use expected

Widespread use of the device is expected in the construction and steel industries. On construction and demolition jobs, for example, the lance can be used to make vertical and horizontal cuts in concrete without noise or vibration. It is especially valuable on projects where blasting cannot be employed, mechanized methods are considered too costly, or where time may be an important factor. The device and technique are a development reported by the Linde Co., Div. of Union Carbide Corp., New York, N. Y.

Sample 5: figure 1: Over-all view of job shows 2 sections of wall (A&B) slated for removal. Two vertical cuts have been completed in each of 2 sections of wall. Two holes have been pierced in each of resulting four sections so that cables can be run through wall facilitating removal by overhead crane.

Sample 5: figure 2: Sparks fly as powder lance completes a vertical cut. Helmet, safety goggles, and heavy clothing protect operator from any sparks that might possibly be blown back at him.

Sample 5: figure 3: Section of wall secured by overhead cranes, operator finishes horizontal cut that will ready section for removal. Ease of handling equipment indicated by relaxed position of operator.



Sample 5: figure 4: After final horizontal cut is completed, two 50-ton cranes easily lift a 22-ton section of reinforced concrete wall up and away for disposal.

PRODUCTS, EQUIPMENT, MATERIALS

Report of recent developments by industry, based on data furnished by mfrs. Inquiry cards for further information face pages 1 and 46.

DIAPHRAGM VALVE FOR FAUCETS

MFR'S DESCRIPTION: *Aquaseal* is diaphragm-type valve, said to eliminate seat washer.

USES: plumbing installations.

SPECS/FEATURES: fittings reported to have no conventional washer, will not drip, waste water or require frequent servicing. Rotation of stem releases tension in valve which is opened by normal water pressure. Stainless steel insert in valve acts as bearing plate against which stem operates. All moving parts are outside flow area.

AIA FILE NO. 29-H

MFR: PLUMBING & HEATING DIV., AMERICAN-STANDARD

Circle 200 for further information

LUMINAIRE WITH AUTOMATIC LATCHING

MFR'S DESCRIPTION: *Lo-Brite* recessed luminaire with concave *Controlens* for 12″ tile construction announced, featuring automatic latching.

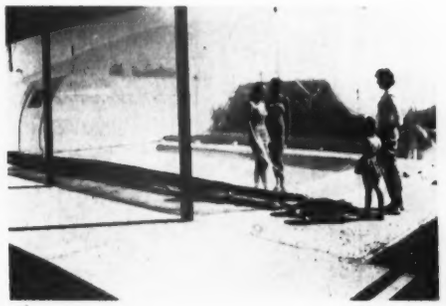
USES: interiors.

SPECS/FEATURES: said to combine economy with uniform luminosity, low viewing brightness and high efficiency. Features die-cast, corrosion resistant cast zinc door and trim designed to fit into 12″ ceiling opening. Two mounting rails furnished eliminating need for plaster frames, according to mfr. Automatic latching said to facilitate relamping.

AIA FILE NO. 31-F-23

MFR: HOLOPHANE CO., INC.

Circle 201 for further information



PLASTIC SHELTER FOR OUTDOOR POOLS

MFR'S DESCRIPTION: *Space-Arena* is portable, transparent plastic enclosure, designed to permit year 'round use of swimming pools and minimize winter maintenance.

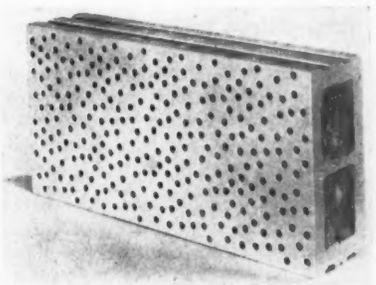
USES: outdoor swimming pools.

SPECS/FEATURES: has no structural members; is air-supported by 1/10 hp blower. Constructed from Union Carbide Plastics' flexible *Krene* vinyl sheeting with heat retention properties; auxiliary heat supplied by electric heater. Sides are 8′ high; center 12′. Standard sizes up to 40′ x 60′. Custom, rectangular sizes obtainable. Reported not to rot or mildew when stored.

AIA FILE NO. 35-F-2

MFR: PLASTIMAYD CORP.

Circle 202 for further information



GLAZED STRUCTURAL ACOUSTICAL TILE

MFR'S DESCRIPTION: ceramic glazed structural acoustical tile introduced, called *SoundBAR.*

USES: sound insulation and absorption in hospitals, schools, auditoria, factories, etc.

SPECS/FEATURES: units reportedly permit construction of load bearing walls incorporating acoustical control. Also resistant to moisture and fire, can withstand abrasion, has thermal insulation value and maintenance ease and adaptability. Armour Research Foundation reports product has noise reduction coefficient of .65.

AIA FILE NO. 10-B

MFR: ARKETEX CERAMIC CORP.

Circle 203 for further information

PRODUCTS, EQUIPMENT, MATERIALS

RAIN-CARRYING EQUIPMENT WITH ENAMEL FINISH

MFR'S DESCRIPTION: aluminum rain-carrying equipment available with precoated, permanent baked enamel finish.

USES: residential, institutional and commercial applications.

SPECS/FEATURES: adaptable for original and replacement installations. Formed from heavy gauge *Alclad* sheet. Gutters, rectangular downspouts and visible accessories available with coating. Hanging method developed, according to mfr, to eliminate straps, slip joint connectors and inflexible miter joints.

AIA FILE NO. 29-C-3

MFR: ALUMINUM CO. OF AMERICA

Circle 204 for further information

VINYL-COATED ALUMINUM FENCING

MFR'S DESCRIPTION: *Colorweve* units, manufactured by Plastic Lume, Inc., are strips of colored, vinyl-coated aluminum.

USES: as decorative screen applied to chain link fencing.

SPECS/FEATURES: strips may be snapped into place between chain links of conventional fencing. Tie-in slats, woven diagonally through links, anchor strips in place. Variety of fence stylings and patterns reported possible. Strips are available in 2,500′ coils on 5″ diameter core.

AIA FILE NO. 14-K

MFR: ALUMINUM CO. OF AMERICA

Circle 205 for further information

VAPOR BARRIERS ARE FIREPROOF

MFR'S DESCRIPTION: *Pyro-Kure* is line of low cost vapor barriers with permanent fire resistance.

USES: heating, ventilating and construction applications.

SPECS/FEATURES: units consist of aluminum foil and kraft paper bonded together with flame extinguishing adhesive and reinforced with fibrous glass strands. Mfr emphasizes flame resistance, vapor proofing qualities, strength and durability, low cost and attractive appearance. Maximum water vapor permeability said to be less than 0.10 perms. According to UL, average flame spread is 15 on foil side and 30 on kraft side.

AIA FILE NO. 37-E-1

MFR: AMERICAN SISALKRAFT CORP.

Circle 206 for further information

Mahon M-FLOOR Construction

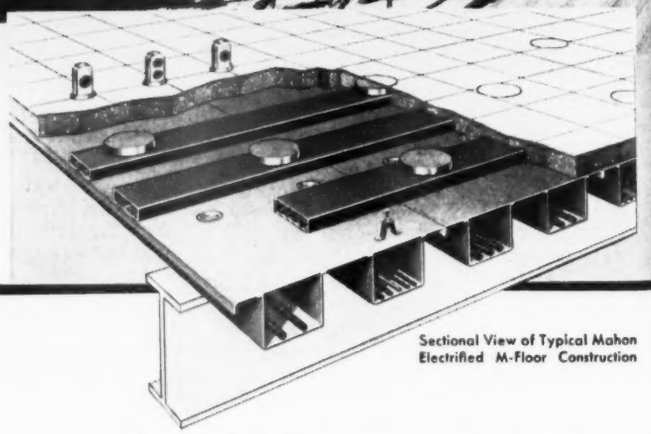
New City-County Building, Indianapolis, Ind.

Mahon M-Floor Construction throughout this modern building assures adequate in-the-floor raceways to meet any future requirements in electrical distribution or intercom wiring.

Architects and Engineers: Allied Architects & Engineers of Indianapolis, Inc.

Associate Architects: Harley, Ellington & Day.

General Contractor: Huber, Hunt & Nichols, Inc.



Sectional View of Typical Mahon Electrified M-Floor Construction

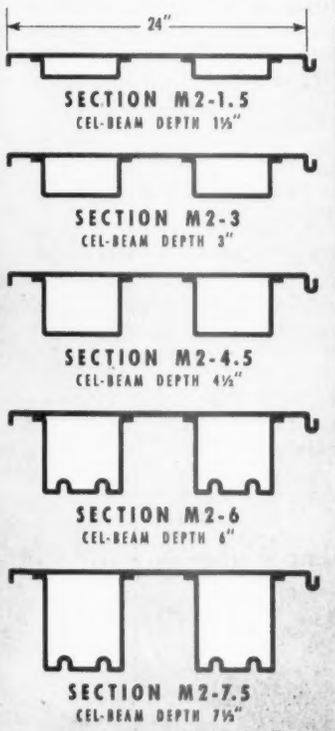
Serving the Construction Industry Through Fabrication of Structural Steel, Steel Plate Components, and Building Products

Circle 112 for further information

Safeguards Modern City-County Building Against Electrical Obsolescence!

M-Floor Cel-Beam Sections Provide Adequate Raceways Under Every Square Foot of Floor Surface

MAHON M-FLOOR SECTIONS



☆ OTHER MAHON BUILDING PRODUCTS and SERVICES:

- Insulated Metal Curtain Walls
- Underwriters' Rated Metalclad Fire Walls
- Rolling Steel Doors (Standard or Underwriters' Labeled)
- Steel Roof Deck
- Long Span M-Decks (Cellular or Open Beam)
- Permanent Concrete Floor Forms
- Acoustical and Troffer Forms
- Acoustical Metal Walls and Partitions
- Acoustical Metal Ceilings
- Structural Steel—Fabrication and Erection
- Steel Plate Components—Riveted or Welded

☆ *For INFORMATION See SWEET'S FILES or Write for Catalogues*

THE R. C. MAHON COMPANY • Detroit 34, Michigan
Sales-Engineering Offices in Detroit, New York, Chicago, Los Angeles and San Francisco • Sales Representatives in all other Principal Cities

of Steel and Aluminum

MAHON

Circle 112 for further information

PRODUCTS, EQUIPMENT, MATERIALS

STEEL CURTAIN WALL STRUCTURES

MFR'S DESCRIPTION: *Airwayte* structures of steel curtainwalls developed, designed to occupy minimum of space.

USES: housing air travelers between flights.

SPECS/FEATURES: structure has base 16′ by 19′ which houses lobby and stairwell. Upper part, containing 18 compartments, is 75′ long, 20′ wide and 21′ high; stands 9′ above ground. Exterior walls are porcelain enamel on steel, supplied in range of colors. Panels are 2⅝″ thick; contain fibrous glass insulation. Interior panels are vinyl coated. Two structures projected for erection at Washington National Airport in 1960.

AIA FILE NO. 17-A

MFR: AMERICAN BRIDGE DIV. OF UNITED STATES STEEL CORP.

Circle 207 for further information

ADHESIVES

ADHESIVE FOR LAMINATION/BONDING

MFR'S DESCRIPTION: industrial adhesive called *Plyophen 2000-PGL* is phenolic resin supported by paper film.

USES: manufacture of plywood, bonding veneers, plastic overlays, etc.

SPECS/FEATURES: said to eliminate need for glue spreading equipment, and possess advantages over liquid glues. Adhesive is placed between two surfaces and bond is cured in hot press or by high frequency field heating. Standard widths available are 38″, 50″ and 62″.

AIA FILE NO. 24-A

MFR: REICHHOLD CHEMICALS, INC.

Circle 208 for further information

LOW COST EPOXY ADHESIVE

MFR'S DESCRIPTION: *Bondmaster M685* is 100 per cent solids, unfilled, modified epoxy adhesive, formulated to permit pricing at from ½ to 1/3 normal cost per gallon.

USES: diversified panel bonding applications.

SPECS/FEATURES: product is free-flowing liquid (approximately 3,000 to 7,000 cps), intermediate strength, clear pale amber, two component, modified epoxy adhesive. Assembly reportedly can be handled, at room temperature, in 6-8 hrs, and develops 85 per cent of maximum strength in 14-24 hrs. Originally developed for bonding of rigid expanded polysty-

STANPAT SOLVES THE GHOSTING PROBLEM

NEW resin-base STANPAT ELIMINATES GHOSTING, offers better adhesion qualities on specific drafting papers!

THE PROBLEM
Some of our longtime customers first called our attention to the "ghosting" problem. Certain tracing papers contain an oil which could be leeched out by the STANPAT adhesive (green back) causing a ghost.

THE SOLUTION
A new STANPAT was developed (red back), utilizing a resin base which did not disturb the oils and eliminates the ghost. However, for many specific drafting papers where there is no ghosting problem, the original (green back) STANPAT is still preferred.

WHICH ONE IS BEST FOR YOU?
Send samples of your drawing paper and we will help you specify. Remember, STANPAT is the remarkable tri-acetate pre-printed with your standard and repetitive blueprint items—designed to save you hundreds of hours of expensive drafting time.

SO SIMPLE TO USE

1. PEEL the tri-acetate adhesive from its backing.

2. PLACE the tri-acetate in position on the tracing.

3. PRESS into position, will not wrinkle or come off.

STANPAT CO.
Phone: FLushing 9-1693-1611
WHITESTONE 57, N. Y., Dept. 153

☐ Enclosed are samples of the drafting paper(s) I use (identify manufacturer). Please specify whether Rubber Base or Resin Base STANPAT is most compatible with these samples.

☐ Send literature and samples of STANPAT.

☐ Please quote price on our enclosed sketches which we are considering to have pre-printed.

NAME_____

FIRM_____

ADDRESS_____

CITY_____

ZONE____ STATE_____

Circle 113 for further information

rene to metal, wood, etc., metal to metal, metal to plastic bonding and economical use in sandwich panel construction now permitted because of low cost, according to mfr.

AIA FILE NO. 24-A

MFR: RUBBER & ASBESTOS CORP.

Circle 209 for further information

DOOR/WINDOW UNITS

NON-TRIP SADDLE AS SAFETY FEATURE

MFR'S DESCRIPTION: non-trip saddle is safety feature added to weather stripping line.

USES: outward opening doors in schools and hospitals.

SPECS/FEATURES: available in extruded bronze and aluminum; can be fitted with flexible hook or extruded rigid interlock.

AIA FILE NO. 16

MFR: ZERO WEATHER STRIPPING CO., INC.

Circle 210 for further information

DURABLE ALUMINUM DOOR CLOSER

MFR'S DESCRIPTION: corrosion-free, aluminum door closer, reported not to need lubrication, announced.

USES: exterior screen and storm doors.

SPECS/FEATURES: main structural member is one-piece, forged aluminum tube by Alcoa, said to provide 20 per cent increase in air cushion and prevent air leakage. Reported to retain original finish and color indefinitely.

AIA FILE NO. 27-B

MFR: LOCKWOOD HARDWARE MFG. CO.

Circle 211 for further information

SLIDING WINDOWS OF ALUMINUM

MFR'S DESCRIPTION: sliding aluminum windows announced in wider choice of styles.

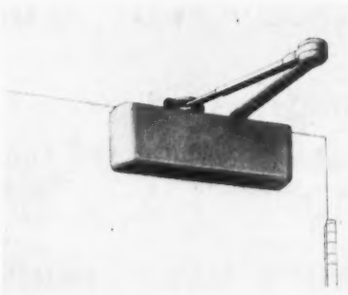
USES: residential installations.

SPECS/FEATURES: units consist of interior sash, self storing storm sash and *Fiberglas* screen in four channel extruded aluminum frame. Insulating air, 1¾" deep, between sash said to reduce heating and cooling costs. Are double weatherstripped with interlocking weatherstripped meeting rails. Sash operates on nylon guides, eliminating metal-to-metal contact. Available in 31 sizes from 2'0" by 2'1" to 8'0" by 5'1".

AIA FILE NO. 16-E

MFR: FLEET OF AMERICA, INC.

Circle 212 for further information



ADJUSTABLE CLOSER FOR HEAVY DOORS

MFR'S DESCRIPTION: *Smoothee* door closers offered in three larger sizes.

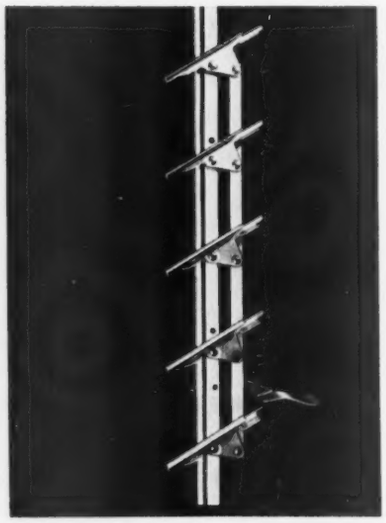
USES: exterior, larger interior, vestibule and other heavy doors.

SPECS/FEATURES: mfr claims unit is compact, easily installed and surface-applied. Closing, latching speeds, back check and spring power separately adjustable. Seven types offered.

AIA FILE NO. 27-B

MFR: LCN CLOSERS, INC.

Circle 213 for further information



ADDITION TO JALOUSIE LINE

MFR'S DESCRIPTION: *Win-Dor Series 1000*, lever-powered jalousie window hardware set, added to line of worm-and-gear type jalousie units.

USES: with outside screens or indoor partitioning.

SPECS/FEATURES: series operates with stainless steel lever type handle and lock for finger tip convenience. Lever is connected to tilt bar which raises and lowers jalousie slats. Slats are 4½" wide and 3/16" or 7/32" thick. Vinyl weather stripping provided at jambs. Available with clear or obscure glass slats.

AIA FILE NO. 27-B

MFR: THE CASEMENT HARDWARE CO.

Circle 214 for further information

OFFICE AIDS

ELECTRIC TYPEWRITER WITH AUTOMATIC CONTROLS

MFR'S DESCRIPTION: fractional back-spacer is latest improvement in electric typewriter models.

USES: office uses.

SPECS/FEATURES: back-spacer permits typists to execute any fraction of a back-space, enabling them to insert omitted letters into body of typed material. Other features include: variety of distinctive type styles; sloping keyboard; visible margins; and positioning scales.

AIA FILE NO. 35-H-4

MFR: REMINGTON RAND DIV., SPERRY RAND CORP.

Circle 215 for further information

OFFICE FLOOR PROTECTION

MFR'S DESCRIPTION: *Florgard*. is ridged, plastic strip for attachment to bottoms of file cabinets.

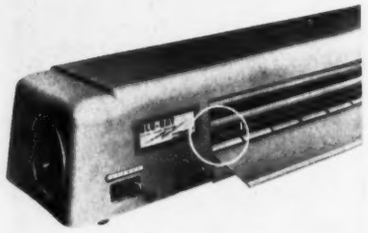
USES: floor protection against rust and stains.

SPECS/FEATURES: unit is held on cabinet bottom by adhesive application. Mfr claims elimination of rust marks and stains and reduction of depressions left by heavy cabinets.

AIA FILE NO. 35-H-4

MFR: RALPH E. BAKER CO., INC.

Circle 216 for further information



REMOVABLE CYLINDER FOR WHITEPRINTER

MFR'S DESCRIPTION: features to facilitate cleaning added to *Blu-Ray* whiteprinter.

USES: copying of drawn, typed, written or printed documents.

SPECS/FEATURES: pyrex cylinder

added to provide better light transmission and enable removal to facilitate cleaning. UL and CSA approved product available in 14", 27" and 42" printing capacities. "Pick-off" bar prevents cylinder from becoming scratched or marked.
AIA FILE NO. 35-H-3
MFR: REPRODUCTION ENGINEERING CORP.
Circle 217 for further information

TAPE LINE EXPANDED

MFR'S DESCRIPTION: 15 colored matte surface tapes are offered.
USES: drafting aid.
SPECS/FEATURES: expanded line includes plant layout symbols, border tapes, special reference design, etc., pre-printed on tape. Reported as non-reflecting and suitable for marking with pen, pencil or other marking device. Available in 7 widths.
AIA FILE NO. 35-H-3
MFR: ACS TAPES, INC.
Circle 218 for further information

FILM FOR LAMINATION AND DRY MOUNTING

MFR'S DESCRIPTION: *Sealamin* laminating film developed for lamination of paper on seal presses.
USES: protection of blueprints, drawings and specification sheets.
SPECS/FEATURES: used in seal dry mounting presses, material can laminate paper on both sides in 15 seconds, according to mfr. Available in rolls 11⅛" wide by 200' long.
AIA FILE NO. 35-H-3
MFR: SEAL, INC.
Circle 219 for further information

DISPENSING PACKAGE FOR TAPES

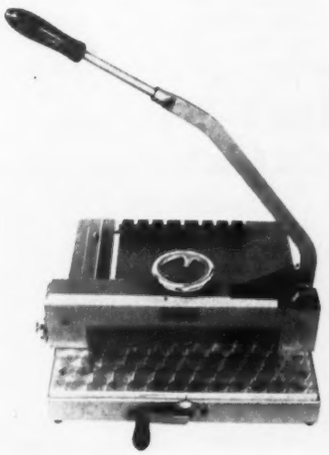
MFR'S DESCRIPTION: *Zip-A-Line* tapes offered with self-dispensing package, designed for ease of handling and storage.
USES: drafting aid.
SPECS/FEATURES: tape is self-sticking; designed to eliminate tedious line work on charts, layouts, graphs and other visual presentations. Unwinds from plastic reel base. Available in 17 solid and patterned colors, in widths from 1/64" to 2" on rolls of 360" and 650".
AIA FILE NO. 35-H-3
MFR: PARA-TONE CORP.
Circle 220 for further information

CALCULATING MACHINE RESTYLED

MFR'S DESCRIPTION: restyling and functional innovations announced in automatic printing calculator model.
USES: office aid.
SPECS/FEATURES: keyboard is at 24° angle to lessen operator fatigue. Unit is available with listing capacity of 10 digits and 11 capacity grand total. Other features are automatic credit balance, constant total and total transfer, more legible characters and cadmium plating to protect against rust and wear. Height is 7¾"; weight, 24 lbs; desk model is 14½" x 9 ¾".
AIA FILE NO. 35-H-4
MFR: VICTOR ADDING MACHINE CO.
Circle 221 for further information

FOUNTAIN PEN FOR DRAFTING

MFR'S DESCRIPTION: *Model 3065*, technical fountain pen, available with holder and seven interchangeable point sections to provide seven different line widths, 00, 0, 1, 2, 2½, 3, and 4.
USES: drawing, ruling and lettering.
SPECS/FEATURES: each section has refillable, translucent plastic ink cartridge and is numbered for instant identification. Interchange of points is accomplished easily and in complete cleanliness, according to mfr. All parts are acid-resistant, permitting use of many types of ink.
AIA FILE NO. 35-H-3
MFR: KOH-I-NOOR PENCIL CO.
Circle 222 for further information



PAPER CUTTER FOR OFFICES

MFR'S DESCRIPTION: *Triumph* manual paper cutter announced.
USES: office duplicating departments.
SPECS/FEATURES: available in 14" and 18" sizes. Simple, effective operation emphasized. Features: all metal frame construction; cutting thickness of 3¼"; front calibration wheel; and ample working area.
AIA FILE NO. 35-H-4
MFR: MICHAEL LITH SALES CORP.
Circle 223 for further information

LIGHTING

LIGHTING FIXTURE WITH ELECTRICAL ASSEMBLY

MFR'S DESCRIPTION: *Shallotroffer* is recessed type lighting fixture with "plug-in" electrical assembly, replaceable at ceiling.
USES: lighting applications.
SPECS/FEATURES: unit said to offer economies and efficiencies in maintenance and performance. Fixture recessed into 5½" plenum chamber.
AIA FILE NO. 31-F-23
MFR: GLOBE ILLUMINATION CO.
Circle 224 for further information

LIGHTING FIXTURE FOR HIGH OUTPUT

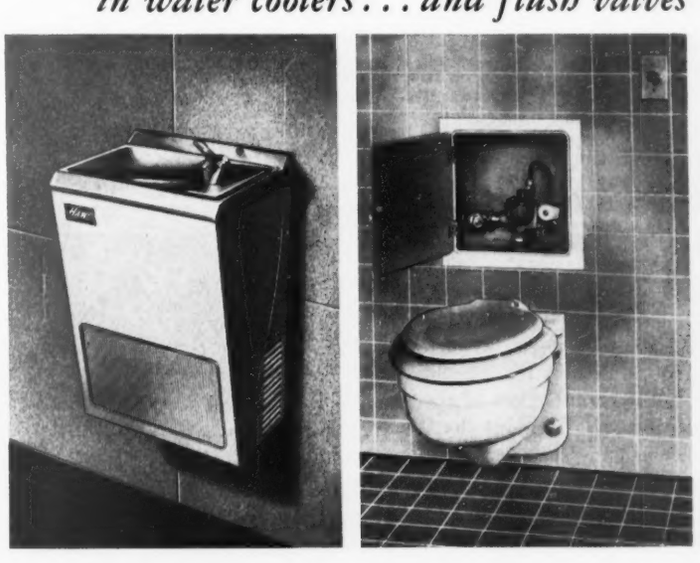
MFR'S DESCRIPTION: *Director* is commercial fixture for high light output.
USES: commercial and semi-industrial areas requiring high lighting levels.

SPECS/FEATURES: fixture has 19" wide area of light; 2-lamp unit produces 30,000 lumens of illumination, ⅓ more than conventional 4-lamp unit and equal to 6-lamp unit, according to mfr. Diffusion characteristics also featured. May be pendant mounted individually or in continuous rows.
AIA FILE NO. 31-F-23
MFR: SMITHCRAFT LIGHTING
Circle 225 for further information

HAWS

BEST FOR NEW IDEAS

in water coolers . . . and flush valves



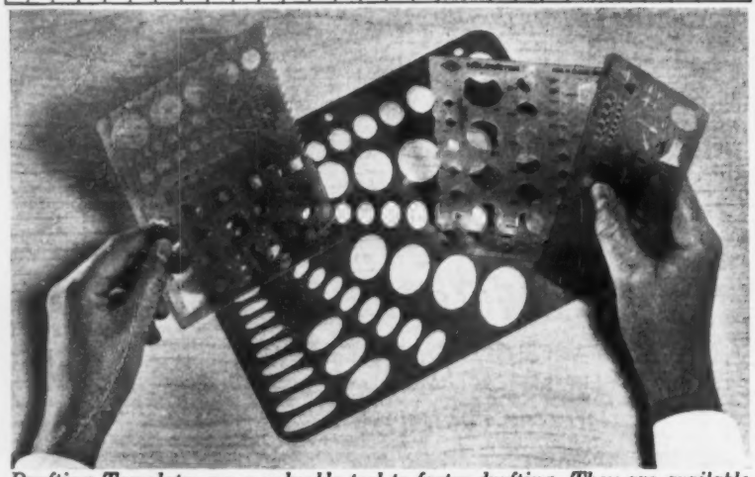
Haws Wall Mounted "Off the Floor" Water Coolers break with tradition to "clear the deck" for uncluttered maintenance ease. Crisp styling and the completely enclosed plumbing-electrical unit make this distinctive cooler a Haws "first"—in beauty *and* engineering!

Haws-Kramer Residential Flush Valve System utilizes the newly-developed Nyla-Phragm valve to reduce bathroom flushing noises and eliminate long, noisy tank refill. And here's another "first": out-of-sight H-K "Silent Service" operates with *conventional residential pipe sizes!*

Specify these new Haws items. See them in Sweet's Architectural File or write for complete Haws catalog—today!

HAWS DRINKING FAUCET COMPANY
1441 FOURTH STREET • BERKELEY 10, CALIFORNIA
HAWS/KRAMER FLUSH VALVE DIVISION
819 Bryant Street • San Francisco 3, California
EXPORT DEPARTMENT: 19 Columbus Avenue • San Francisco 11, California • U.S.A.
Circle 114 for further information

DRAFTING TRENDS



Drafting Templates are a valuable tool to faster drafting. They are available in an almost endless variety.

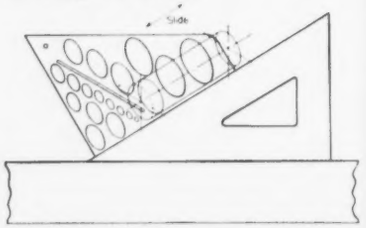
Specialized drafting templates speed drawing time

Always a handy tool, drafting templates are becoming increasingly in use to simplify everyday drawing techniques. Now vinyl plastics are used in the manufacture of the majority of templates. But the thickness, color and finish vary in almost endless profusion. Glare-saving colors, such as green and amber, are usual, both in clear and matte finishes. However, the white and clear plastics still are popular. The thicknesses vary with the different types of available templates from .020 gauge through .070 gauge.

Specialized template applications

A list showing the growing application for templates includes templates for: Electronic Symbols, Electrical Wiring, Landscaping, Screw Heads, House Plans, Nuts and Bolts, Screw Threads, Tooling, Windows, Plumbing, Mathematical Symbols, Map Planning, and many "all-purpose" templates for circles, ellipses, triangles, and other shapes.

Isometric ellipse template is a big timesaver



An isometric ellipse template may be more useful if it is cut in half to provide edges parallel to the minor axes of the ellipses. Halves of the template may then be moved along a 30-60 degree triangle so that ends of a shaft or any cylindrical shape can be drawn in a minimum of time and in perfect alignment.

A selection of 52 popular templates is illustrated and described in a special six page brochure, "Drafting Templates" recently published by Frederick Post Company. *For your copy, write Frederick Post Company, 3654 N. Avondale Ave., Chicago, Illinois.*

POST

SENSITIZED PAPERS & CLOTHS • TRACING & DRAWING MEDIUMS • DRAWING INSTRUMENTS & SLIDE RULES
ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE
Circle 115 for further information

UNITS FOR STRIP LIGHTING

MFR'S DESCRIPTION: *Lite-Way*, 2-lamp strip units, said to be competitively priced, announced.
USES: strip lighting applications in supermarkets, corridors, homes, etc.
SPECS/FEATURES: has 4′ or 8′ rigidized chassis, CBM ballast and is fused to give safe overload protection. Can be transformed into finished, shielded fixture by adding *Fairview* enclosure.
AIA FILE NO. 31-F-23
MFR: DAY-BRITE LIGHTING, INC.
Circle 226 for further information

FLUORESCENT SIGN LIGHTS

MFR'S DESCRIPTION: *Weathertight-Fluor-O-Lux* line of fluorescent sign lights announced.
USES: floodlighting highway signs, building fronts, etc.
SPECS/FEATURES: maximum efficiency and ease of installation and maintenance stressed. Parabolic shaped reflector intended for maximum usable light and minimum spill. Choice of types offered in 4′, 6′ and 8′ lengths.
AIA FILE NO. 31-F-27
MFR: WHEELER-FULLERTON LIGHTING DIV., FRANKLIN RESEARCH CORP.
Circle 227 for further information

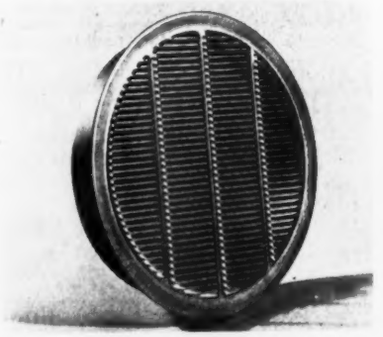
HVAC

ATTIC VENT PANEL INSTALLATION

MFR'S DESCRIPTION: self-ventilating method of installing supplementary attic vent panels developed as innovation by Smith-Feldman Construction Co.
USES: residential and commercial construction.
SPECS/FEATURES: cleats of scrap lumber nailed to rafters betwen plate and roof sheathing, rather than enclosing roof overhang itself. Openings between rafters filled with ¼″ *Peg-Board*. Panels reportedly keep out wildlife and provide roof ventilation at lower cost than other methods. Installation of panels said to require only one man. Panels can be painted.
AIA FILE NO. 12
MFR: MASONITE CORP.
Circle 228 for further information

CABINETS CONCEAL PERIMETER HEATING

MFR'S DESCRIPTION: *Chromalox* electric baseboard introduced for concealed mounting behind metal storage cabinets.
USES: electric perimeter heating in schools, offices and libraries.
SPECS/FEATURES: cabinets are 16 gauge steel with enamel finish, available in 2, 3, and 4 foot lengths, 26½″ high and 13¼″ deep. Sliding doors available. Cabinet base and top grille are perforated to permit air circulation. Air enters through cabinet base, is heated and rises upward through top grille, to counteract downdrafts.
AIA FILE NO. 30-C-44
MFR: EDWIN L. WIEGAND CO.
Circle 229 for further information



ONE-PIECE ALUMINUM LOUVER

MFR'S DESCRIPTION: *RLS Series*, grilled, one-piece midget louver, added to louver line.
USES: general air circulation uses, including outdoor installations.
SPECS/FEATURES: openings are smaller than screening, to eliminate need for screen unit. Composed of anodized aluminum, impervious to sea air and salt water. Diameters offered: 1″; 1½″; 2″; 2½″; 3″; and 4″. Installation requires no nails or screws, only pressing into pre-drilled hole.
AIA FILE NO. 30-J
MFR: MIDGET LOUVER CO.
Circle 230 for further information

HERMETIC ABSORPTION COLD GENERATOR

MFR'S DESCRIPTION: hermetic absorption cold generator, powered by low-pressure steam, using water as refrigerant and lithium bromide as absorbent, introduced.
USES: cooling of hotels, apartments, offices, etc.
SPECS/FEATURES: capacities range from 100 to 350 tons; suited for single or multiple unit installations. Mfr claims single-shell design and hermetic pumps prevent air leakage to maintain full-rated capacity and resist oxidation. Control system operates machine at conditions which avoid crystallization, according to mfr. Reported as lightweight, quiet and nearly vibration free.
AIA FILE NO. 30
MFR: THE TRANE CO.
Circle 231 for further information

PREFABRICATED RIDGE VENTILATOR

MFR'S DESCRIPTION: *Vent-A-Ridge* is prefabricated, all-aluminum ridge ventilator, designed for improved ventilation and control of rain and snow infiltration.
USES: condensation and temperature control.
SPECS/FEATURES: FHA accepted unit is available in 8′, 9′ and 10′ lengths. Said to provide 18 sq in of net free area per lineal foot with ⅛″ reversed louvers on underside to provide protection from rain and snow. Stated to fit any type of pitch roof construction.
AIA FILE NO. 30-D-1
MFR: HC PRODUCTS CO.
Circle 232 for further information

HIGH CAPACITY HEAT/AC UNITS

MFR'S DESCRIPTION: high capacity room air conditioners and heat pumps featured among over 100 models of 1960 line.
USES: residential and commercial uses.
SPECS/FEATURES: among units are *Gold Medallion Special Custom Model 1350C*, room air conditioner with capacity of 13,500 btu/hr, and *Gold Medallion Super Custom Model 2390C*, room air conditioner with 23,900 btu/hr capacity. Available in hardwood cabinets in five finishes.
AIA FILE NO. 30
MFR: THE MATHES CO., DIV. GLEN ALDEN CORP.
Circle 233 for further information

ALUMINUM GRILLE FOR VENTILATION

MFR'S DESCRIPTION: *Curtainaire* is extruded aluminum grille, added to line of air distribution products.
USES: supply and return air installations.
SPECS/FEATURES: available in widths from 1½″ to 15″, in lengths up to 12′, in one piece. Two frame widths are standard with friction springs for floor or sill installation, or safety catches for wall or ceiling installations.
AIA FILE NO. 30-J
MFR: CARNES CORP.
Circle 234 for further information

WATER COOLING TOWER LINE

MFR'S DESCRIPTION: *4-B Series*, line of water cooling towers, announced.
USES: air conditioning and refrigeration applications.
SPECS/FEATURES: features include low silhouette and quiet operation, achieved, according to mfr, through use of squirrel cage blowers rather than propeller fans. Sixteen sizes available with capacities ranging from 5 to 360 tons. Maximum heights range from 5′5″ to 7′8″, exclusive of foundation beams. Units are constructed of heavy gauge steel.
AIA FILE NO. 30-F-3
MFR: BINKS MFG. CO.
Circle 235 for further information

SMOKELESS, SOOTLESS OIL HEATING BOILER

MFR'S DESCRIPTION: *Custom Mark II*, oil burning boiler, developed with substantial fuel savings reported.
USES: residential heating.
SPECS/FEATURES: unit designed to provide hot water or steam heat plus domestic hot water supply, with total combustion of oil and no smoke, soot or odors, according to mfr. Utilization of combustion principle said to result in fuel savings of from 25 to 33 per cent. Available with heating capacities of 110,000 and 145,000 btu/hr. Is 35″ high, 20½″ wide and 50″ long.
AIA FILE NO. 30-C-1
MFR: IRON FIREMAN MFG. CO.
Circle 236 for further information

GAS-FIRED, INFRA-RED RADIANT HEATERS

MFR'S DESCRIPTION: portable, gas-fired, infra-red radiant heaters developed.
USES: spot heating, thawing, curing and drying in industrial plants, farm buildings, etc.
SPECS/FEATURES: available in three sizes, the smallest weighing 8 lbs; has rated input of 16,000 btu and operates at less than 5 cents/hr according to mfr. Seven adjustment positions are provided from 3½′ to 7′ high.
AIA FILE NO. 30-B-5
MFR: PERFECTION INDUSTRIES, DIV., HUPP CORP.
Circle 237 for further information

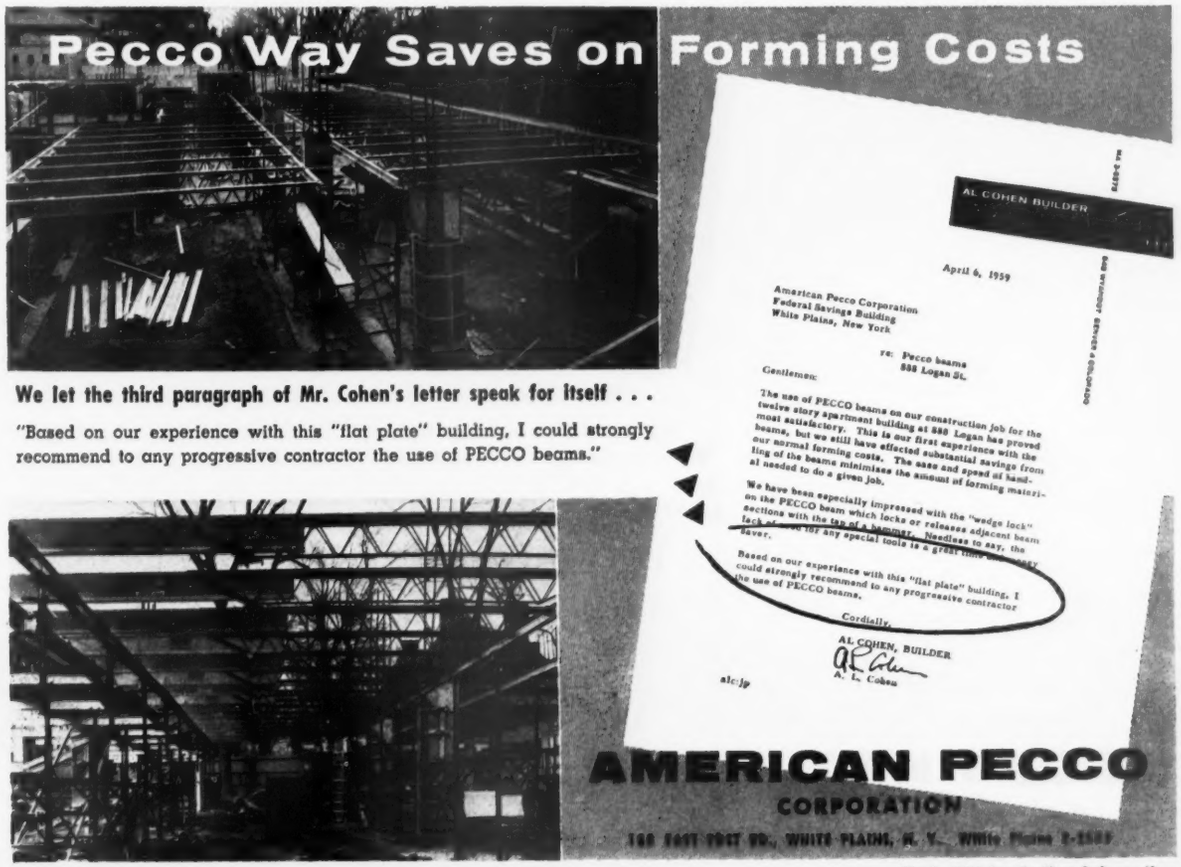
SEALANTS/FINISHES

INSECT PROOF WALL FINISH

MFR'S DESCRIPTION: *Kil-Sect* is wall finish said to combine characteristics of alkyd paint and insecticides.
USES: industrial plants, office buildings and retail establishments.
SPECS/FEATURES: applied in same manner as paint. May be washed without reducing power of insecticide. Available in colors. Has no offensive odor, according to mfr. Insecticide is DDD (dichloro diphenyl dichloroethane). About $7.00 per gal.
AIA FILE NO. 25-B-18
MFR: CONSOLIDATED PAINT & VARNISH CORP.
Circle 238 for further information

ADDITIONS TO SEALING LINE

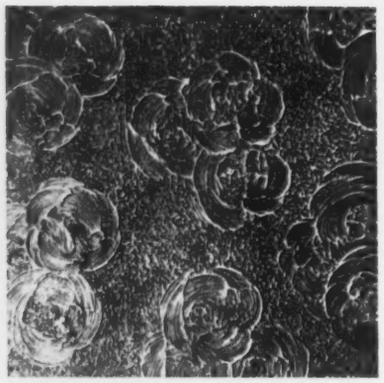
MFR'S DESCRIPTION: six epoxy compounds developed, for addition to sealing line.
USES: building construction and maintenance.
SPECS/FEATURES: compounds include joint sealants, crack sealants, bonding compound, patching compound, skid-resistant surfacing for highways and corrosion resistant surfacing for concrete. Mfr states materials exhibit high bond to structural materials, stability over wide range of temperatures, resistance to corrosion, rapid curing and compatibility to concrete and masonry. Resistance to gasoline, oil, organic


Pecco Way Saves on Forming Costs
We let the third paragraph of Mr. Cohen's letter speak for itself . . .
"Based on our experience with this "flat plate" building, I could strongly recommend to any progressive contractor the use of PECCO beams."
AL COHEN BUILDER
April 6, 1959
American Pecco Corporation
Federal Savings Building
White Plains, New York
re: Pecco beams
888 Logan St.
Gentlemen:
The use of PECCO beams on our construction job for the twelve story apartment building at 888 Logan has proved most satisfactory. This is our first experience with the beams, but we still have effected substantial savings from our normal forming costs. The ease and speed of handling of the beams minimizes the amount of forming material needed to do a given job.
We have been especially impressed with the "wedge lock" on the PECCO beam which locks or releases adjacent beam sections with the tap of a hammer. Needless to say, the lock [illegible] any special tools is a great time saver.
Based on our experience with this "flat plate" building, I could strongly recommend to any progressive contractor the use of PECCO beams.
Cordially,
AL COHEN, BUILDER
A. L. Cohen
alc:jp
AMERICAN PECCO
CORPORATION
Circle 116 for further information

solvents, alkalies and most acids reported.
AIA FILE NO. 4-N
MFR: SIKA CHEMICAL CORP.
Circle 239 for further information

COMBINATION SEALER AND POLISHER

MFR'S DESCRIPTION: *Poli-Seal* is finish for floors reported to both seal and polish in one operation.
USES: finish for varied types of floors.
SPECS/FEATURES: stated to work well on such floors as light terrazzo, white cement, magnesite, white marble, cork, wood, ceramic tile and others. Mfr claims product provides water-white finish which will not darken light floors; is also water resistant and deters efflorescence.
AIA FILE NO. 25-B
MFR: HUNTINGTON LABORATORIES, INC.
Circle 240 for further information



FINISHES FOR CEMENT WALLS

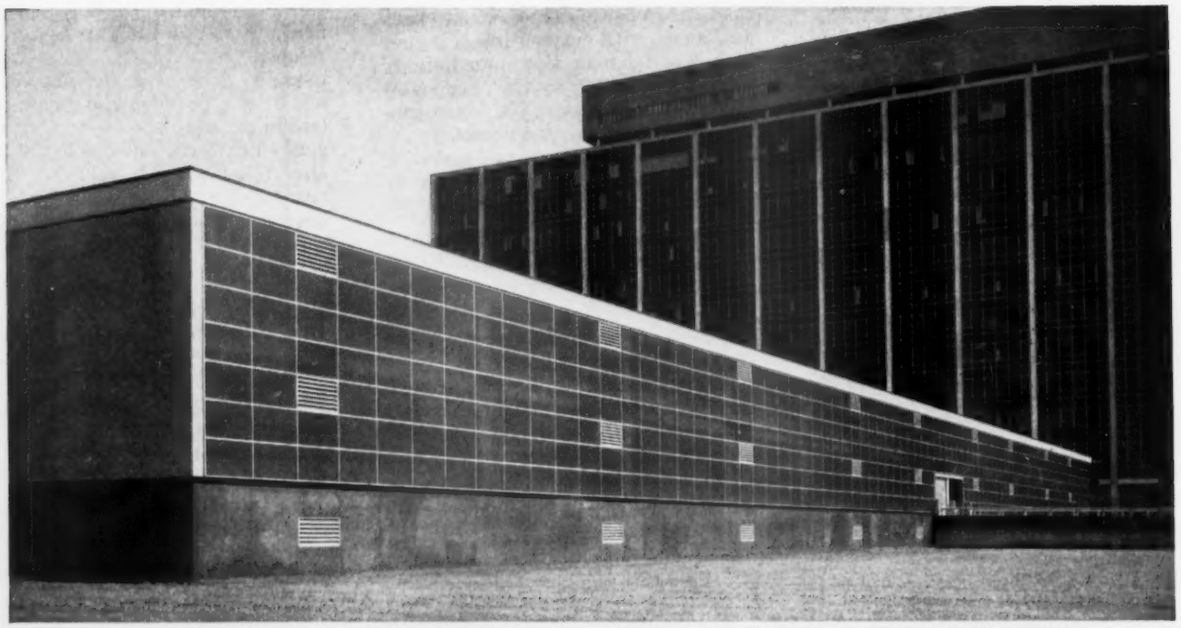
MFR'S DESCRIPTION: three types of finishes for cement announced.
USES: wall surfacing in schools, hospitals and other institutional uses.
SPECS/FEATURES: finishes, which have had successful applications abroad, are: mural process with murals cut into wet background, producing three-dimensional effect; durable cement coating called *Coraltex;* and group of textured finishes designed to produce decorative, multi-color patterns.
AIA FILE NO. 4-P
MFR: CEMENT ENAMEL DEVELOPMENT, INC.
Circle 241 for further information

WOOD UNITS

PATTERNS IN PLYWOOD PANELS

MFR'S DESCRIPTION: *Miraply* panels are pre-finished hardwood plywood with patterns.

MORE *Daylight* PER DOLLAR WITH



Glare reduced Coolite glass achieves high levels of illumination without heat and glare for Ford Motor Company Garage, Dearborn, Michigan.
Glazier: Pittsburgh Plate Glass Co., Detroit

Coolite, Heat Absorbing Glass, glare reduced on the pattern side, provides ideal daylighting for Johnson Motors, Waukegan, Illinois. Architect: Shaw, Metz & Dolle. Contractor: Campbell, Laurie & Lautermilch. Glazier: Waukegan Glass Co.

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TRANSLUCENT GLASS

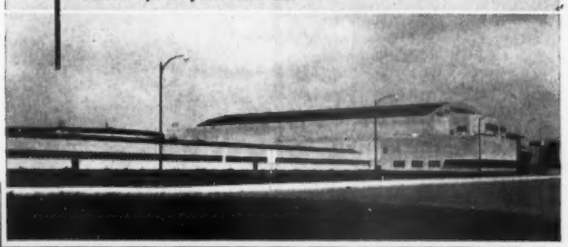
Modern Buildings Utilize Diffusing Glass to Make the Most of Daylight

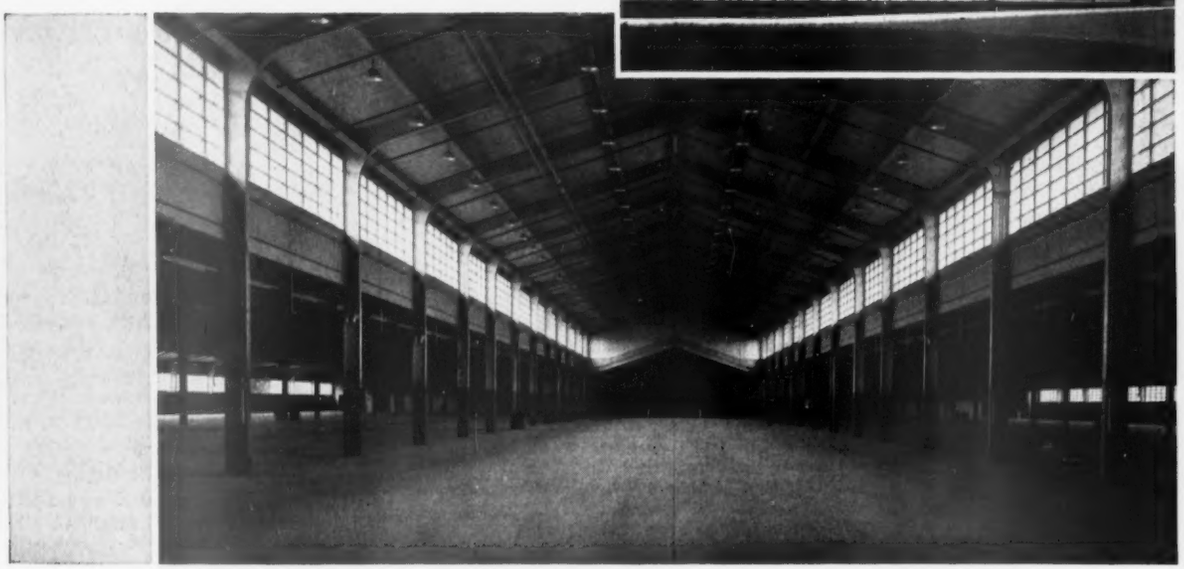
These outstanding buildings enjoy more and better daylighting per glazing dollar because translucent glass diffuses daylight deep into interiors to achieve even, comfortable, overall illumination at low cost. Areas are flooded with inexpensive, natural lighting, free of raw glare. Sharp shadows and contrasts are reduced to make seeing tasks easier. Translucent glass helps create a feeling of spaciousness and comfort. Occupants see better, feel better, work better under improved daylighting. The resulting efficiencies and improved morale make it good business to install translucent glass.

Today's leading architects are taking fullest advantage of translucent glass to achieve interesting, highly functional structures that provide high levels of low cost, natural illumination. Specify glass by Mississippi. Available in a wide range of patterns and surface finishes to solve any daylighting requirement.

Coolite, Heat Absorbing glass, glare reduced, installed in the Twin Disc Clutch Company, Racine, Wisconsin, floods work areas with conditioned daylight . . . absorbs up to 50% of unwanted solar heat. Glazier: Pittsburgh Plate Glass Co.

35,000 sq. ft. of Smooth Rough glass in the Kentucky Fair and Exposition Center, Louisville, Ky., brightens entire interior. Architect: Fred Elswick and Associates of Louisville Photo by: Royal Photo Co.





GLASS COMPANY

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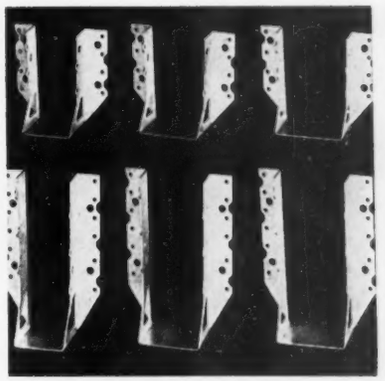
ROLLED, FIGURED AND WIRED GLASS

Circle 117 for further information

PRODUCTS, EQUIPMENT, MATERIALS

USES: various wood paneling uses.
SPECS/FEATURES: *Imperial Cherry, Classic Walnut* and *Royal Oak* patterns offered in 16 color tones. Standard size 4′ x 8′ sheets are random grooved to fall on 16″ centers for nailing to studs and half-grooved at edges to hide butt joints. May be cemented to existing, flat walls.
AIA FILE NO. 19-E-6
MFR: MIRATILE MFG. CO.
Circle 242 for further information



JOIST HANGER LINE EXPANDED

MFR'S DESCRIPTION: *Teco-U-Grip* joist and beam hangers added to joist hanger line.
USES: truss hangers, ceiling framing, roof joists, etc.
SPECS/FEATURES: added units are for 3 x 6 to 3 x 14 and 4 x 6 to 4 x 14 wood members. Included are hangers for double 2 x 6 to double 2 x 14 members which also fit dressed sizes of 4″ glued laminated members. Available in 16 or 14 gauge galvanized sheet steel; nails designed to develop maximum shear value, are furnished.
AIA FILE NO. 19-B-5
MFR: TIMBER ENGINEERING CO.
Circle 243 for further information

FABRICS

TEXTILE COLLECTION EXPANDED

MFR'S DESCRIPTION: six fabrics designed by Alexander Girard, AIA, added to textile collection.
USES: draperies and upholstery.
SPECS/FEATURES: *Plusses, Pumpkin Seeds* and *Small Triangles* are pigment prints, resistant to fading; reported to provide light control and be capable of flameproofing. *Linstripe* and *Linline* are drapery fabrics of linen, combining woven cotton stripes. *Miller Wool* is woolen fabric

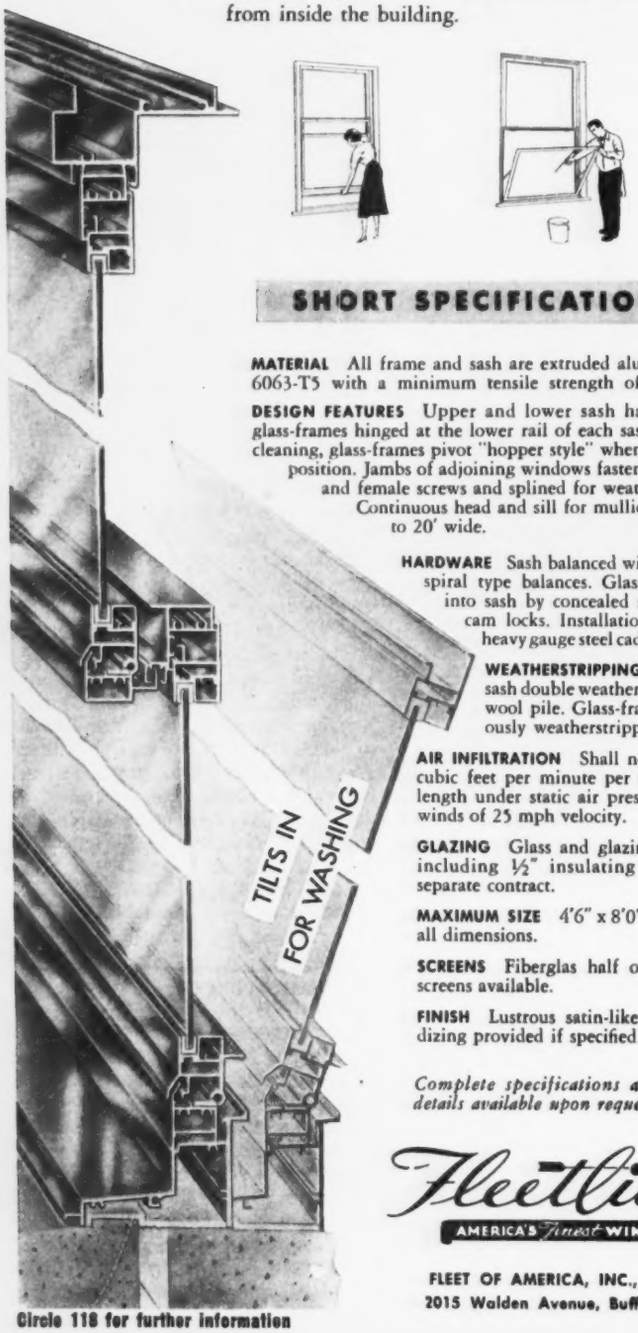
A Product Report for Architects...

Inside Window Washing

with the new Fleetlite double hung

Monumen-*tilt!*

For the architect engaged in conventional and curtain wall design of offices, schools, hospitals and other high rise buildings, Fleetlite offers the only monumental double hung aluminum window that can be fully screened and still cleaned at floor level from inside the building.



SHORT SPECIFICATIONS

MATERIAL All frame and sash are extruded aluminum alloy 6063-T5 with a minimum tensile strength of 22,000 psi.

DESIGN FEATURES Upper and lower sash have extruded glass-frames hinged at the lower rail of each sash. For inside cleaning, glass-frames pivot "hopper style" when in the lower position. Jambs of adjoining windows fastened with male and female screws and splined for weather tightness. Continuous head and sill for mullioned units up to 20' wide.

HARDWARE Sash balanced with removable spiral type balances. Glass-frames lock into sash by concealed stainless steel cam locks. Installation anchors of heavy gauge steel cadmium plated.

WEATHERSTRIPPING Perimeter of sash double weatherstripped with wool pile. Glass-frames continuously weatherstripped to sash.

AIR INFILTRATION Shall not exceed .50 cubic feet per minute per foot of crack length under static air pressure equal to winds of 25 mph velocity.

GLAZING Glass and glazing up to and including ½" insulating glass under separate contract.

MAXIMUM SIZE 4'6" x 8'0" frame overall dimensions.

SCREENS Fiberglas half or full length screens available.

FINISH Lustrous satin-like finish. Anodizing provided if specified.

Complete specifications and full size details available upon request.

Fleetlite®
AMERICA'S *finest* WINDOW

FLEET OF AMERICA, INC., Dept. AEN-10
2015 Walden Avenue, Buffalo 25, N. Y.

Circle 118 for further information

for upholstery, with nylon added for greater tensile strength. Fifteen colors available.

AIA FILE NO. 28-D

MFR: HERMAN MILLER FURNITURE CO.

Circle 244 for further information

UPHOLSTERING FABRIC FOR FURNITURE

MFR'S DESCRIPTION: *Coair* is furniture upholstering fabric said to combine moisture-absorptive and air-circulating qualities of cloth fabrics with durability of vinyl plastics.

USES: office and leisure furniture, cinema seats, etc.

SPECS/FEATURES: mfr claims product permits greater furniture design possibilities. Available in custom colors in minimum quantities of 300 yds.

AIA FILE NO. 28-F

MFR: COTAN DIV., INTERCHEMICAL CORP.

Circle 245 for further information

PLUMBING FIXTURES

SOLENOID VALVES REPLACE FAUCETS

MFR'S DESCRIPTION: *Ultraflo* water control system announced.

USES: residential plumbing installations.

SPECS/FEATURES: feature of system is elimination of faucets at sinks, lavatories, tubs and showers. Substituted are push buttons which may be located wherever desired. System mixes water at heater rather than at fixture. Buttons control solenoid valves through low-voltage electrical system, supplying hot, cold or warm water.

AIA FILE NO. 29-H

MFR: AMERICAN SANITARY MFG. CO.

Circle 246 for further information

LAVATORY WITH OVAL BASIN

MFR'S DESCRIPTION: *Radiant* round lavatory announced for residential use.

USES: bathroom installation.

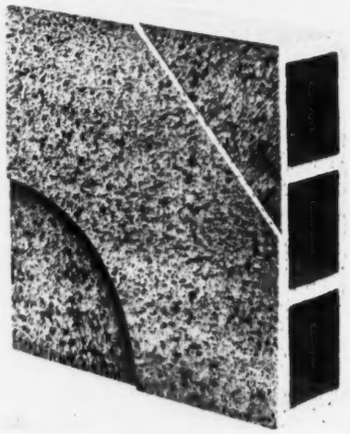
SPECS/FEATURES: made of enameled cast iron, unit measures 18" in diameter; designed for counter top installation. Features concealed front overflow, oval basin and ledge mounted fittings.

AIA FILE NO. 29-H-6

MFR: KOHLER CO.

Circle 247 for further information

TILES



DECORATIVE STRUCTURAL CLAY TILE

MFR'S DESCRIPTION: structural clay tile, *Mal-Tex*, designed to add beauty to any structure.

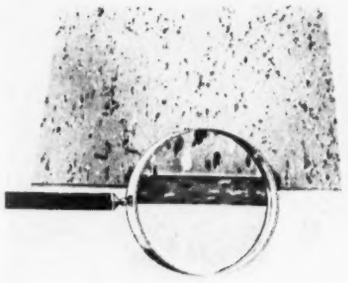
USES: decorative wall applications.

SPECS/FEATURES: material is natural buff color; said to be fireproof, impervious to moisture and sound resistant.

AIA FILE NO. 10-A

MFR: MALVERN FLUE LINING, INC.

Circle 248 for further information



ASBESTOS TILE WITH COLORED CHIPS

MFR'S DESCRIPTION: *Vina-Lux 800 Series* introduced, vinyl asbestos tile with colored chips throughout tile thickness.

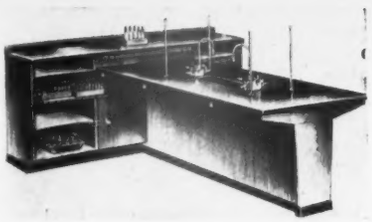
USES: heavy traffic areas.

SPECS/FEATURES: tiles are 9" x 9", ⅛" thick. Intended for installation over concrete or on felt over wood subfloors.

AIA FILE NO. 23-G

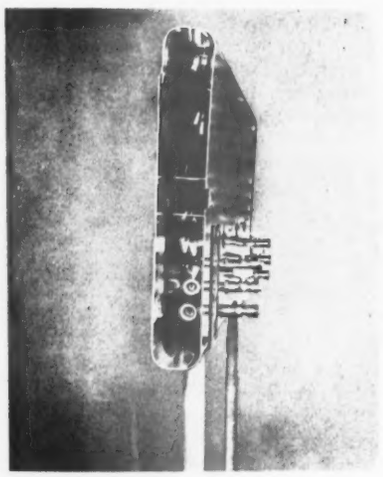
MFR: AZROCK PRODUCTS DIV., UVALDE ROCK ASPHALT CO.

Circle 249 for further information



LABORATORY TABLES FOR STUDENTS

MFR'S DESCRIPTION: line of student laboratory tables offered.
USES: school laboratories for teaching of Semimicro Chemistry.
SPECS/FEATURES: tables are provided with drop front compartment for storage of 107 bottle reagent trays. Available with either individual locked student drawers or open compartments for tote tray method of storing apparatus and glassware. Units are available for 2, 4, 6 and 12 students.
AIA FILE NO. 35-E
MFR: KEWAUNEE MFG. CO.
Circle 250 for further information

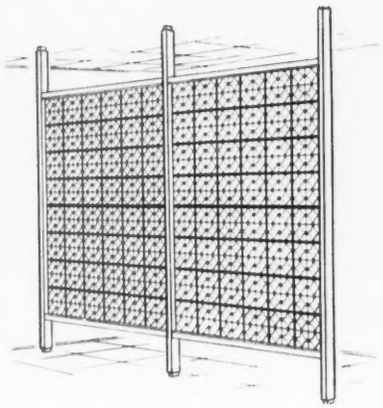


PREFABRICATED SERVICE CHANNEL

MFR'S DESCRIPTION: single, prefabricated channel announced, to carry various services such as power, electrical facilities, etc.
USES: industrial applications.
SPECS/FEATURES: channel is prefabricated pre-engineered unit, in 5′ modules, less than 3″ in width; is designed to hold all plant power and facility lines. To facilitate layout, T's, L's and right angles are offered. Five systems are available for mounting to floor, wall, ceiling or bench with standard brackets, stanchions and mounting devices.
AIA FILE NO. 31-C
MFR: ALDEN SYSTEMS CO.
Circle 251 for further information

RECTANGULAR, STRUCTURAL STEEL TUBING

MFR'S DESCRIPTION: *Espro* structural steel tubing, factory fabricated, in square and rectangular shapes now available in girths and thicknesses to meet exact requirements of architects and structural engineers.
USES: structural columns, beams, mullions, stair stringers, etc.
SPECS/FEATURES: girths range from 12″ to 48″, wall thicknesses from ⅛″ to ½″. Said to be competitively priced. Consists of two channel sections, fused through submerged arc welding.
AIA FILE NO. 13
MFR: ESPRO TUBING DIV., UNION ASBESTOS & RUBBER CO.
Circle 252 for further information



PREFABRICATED PLASTIC GRILLE

MFR'S DESCRIPTION: *FiliGrille*, ¾″ thick styrene grillework, now available.
USES: as screen, space divider, etc., in restaurants, offices, homes and hotels.
SPECS/FEATURES: available in standard designs, factory-fabricated in custom panels. Varied aluminum and wood framing systems offered. Can be used in floor to ceiling installations or open at both base and ceiling.
AIA FILE NO. 24
MFR: HOLCOMB & HOKE MFG. CO., INC.
Circle 253 for further information

CARLSTADT ALUMINUM RAILINGS:
sturdy, attractive, easy to fabricate and install

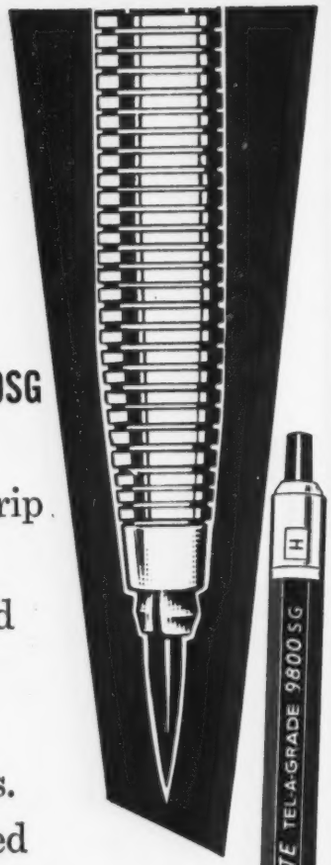
The simplicity and sturdiness of this center railing makes it practical for the most rugged applications. Carlstadt railing components are designed for greatest strength so as to withstand hard usage, as in schools and public buildings. The wide variety of stock handrails, posts and accessories allows the architect freedom of design, while affording the economy of quantity production.

More than 8,000 items in stock. See Catalog No. 8 or Sweet's Architectural File No. 6e/BL. Phones: Carlstadt, N. J., GEneva 8-4600; Philadelphia, MArket 7-7596; New York, OXford 5-2236

JULIUS BLUM & CO. INC., CARLSTADT, NEW JERSEY

JB
Fifty Years
1910-1960

Circle 119 for further information



CASTELL
LOCKTITE 9800SG
no-slip
functional grip
lead holder
gives blessed
relief and
comfort to
tired fingers.
Long, tapered
finger grip and
perfect balance
make drawing,
designing and
drafting
a joy.

Equipped with convenient TEL-A-GRADE device reveals degrees at a glance.

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If it ever happens, that any part of a LOCKTITE Holder breaks in normal usage, the entire holder will be replaced free of charge.

#9030 Imported CASTELL Black Gold Refill Leads fit any standard holder. Perfectly mated with LOCKTITE. Sold by all good Dealers.

A.W.Faber-Castell Pencil Co. Newark 3, N. J.

Circle 120 for further information

DOCUMENTS

American Standards Assn., *70 East 45th St., New York 17, N. Y. and* **American Society of Mechanical Engineers,** *29 W. 39th St., New York 18, N. Y.*

American Standard Graphical Symbols for Welding, *Y32.3-1959, revised standard superseding American Standard Z32.2.1-1949. 100 pp. $3.00.*
New standard eliminates confusing terms. Provides quick reference chart of standard welding symbols.

U. S. Government Printing Office, *Div. of Public Documents, Washington 25, D. C.*

Hardwood Veneered Doors, *Commercial Standard CS171-58, 1959. 26 pp. $.20.*

Wind Pressures in Various Areas of the United States, *by G. N. Brekke, National Bureau of Standards Building Materials and Structures Report 152, 1959. 8 pp. $.15.*

Tables of Osculatory Interpolation Coefficients, *by H. E. Salzer, National Bureau of Standards Applied Mathematics Series 56, 1959. $.30.*

Fuel Consumption in the Home, *Catalog No. HH 1.9/a:5. $.15.*
Provides information on saving money through the correct use of various types of heating fuels, such as coal, oil and gas.

Electric House Heating, *Catalog No. A 68.3:142-½. $.15.*
Describes seven types of electric heating equipment and provides data on estimating and computing installation requirements.

Installation of Attic Ventilation Fans in Residences, *Catalog No. C 18.276:179-51. $.10.*
Covers definitions of terms; general requirements and recommendations, including those for fan, plenum chambers, shutters, air change rate, and velocity through intake and discharge openings; and a uniform method for certifying compliance.

Gas Floor Furnaces—Gravity Circulating Type, *Catalog No. C 18.276.99-52. $.05.*
Covers construction and installation requirements for gravity circulating-type gas floor furnaces, including those having single- or dual-wall-register outlets, for use with natural, manufactured, mixed, liquefied-petroleum, and liquefied-petroleum-air gases.

Virginia Polytechnic Institute, *Blacksburg, Va.*

Bulletin of the Polytechnic Institute, *Wood Construction and Assembly in Europe and Asia and Wood I-Beams and Girders, by E. George Stern, 1959. 30 pp. $.50.*
Paper based on studies made during 4½ week tour in Europe.

National Electrical Manufacturers Assn., *155 E. 44th St., New York 17, N. Y.*

NEMA Standard for Molded Case Circuit Breakers, *AB 1-1959. $.40.*
Covers air circuit breakers, single-pole and multipole, assembled as an integral unit in a supporting and enclosing housing of insulating materials, for current ratings up to and including 800 amperes in frames not exceeding that rating, for nominal voltages up to and including 600 volts ac, 250 volts dc, and with interrupting current ratings of more than 1,000 amperes.

NEMA Standard for Bituminized-fiber Conduits and Fittings, *BC 1-1959. $.30.*
Covers installation of wire and cable; types, sizes, wall thickness, straightness of bore, joints, water absorption, chemical and physical properties.

NEMA Standard for Shunt Capacitors, *CP 1-1959. $.50.*
Revised publication treats service condition, rating, manufacturing, testing, application and operation information for shunt capacitors.

NEMA Standard for Dial Arrangement of Warm Air Limit and Fan Controls, *DC 4-1959. $.20.*
Gives operating range, differential, dial stop and shipping setting for dial arrangement of warm air limit and fan controls.

NEMA Standard for Surface-type Electric Water Heater Controls, *DC 5-1959. $.20.*
Deals with mounting means and terminal markings for surface type electric water heater controls.

PREVIEW: 13

THE ANATOMY OF A NEW PROJECT

UNITED CHURCH OF SQUAW VALLEY	*project*
NORTHERN CALIFORNIA CONGREGATIONAL CONFERENCE	*client*
BARBACHANO, IVANITSKY & WATANABE, AIA	*architects*
STEFAN J. MEDWADOWSKI, PH. D.	*structural engineer*
ROBERT MONTGOMERY, ME	*mechanical engineer*
ROBERT TAYLOR, EE	*electrical engineer*

A 60-foot sculptured aluminum cross will stand before the United Church of Squaw Valley, a $140,000 project now under construction. The inter-denominational church is being constructed by the Northern California Congregational Conference. It will provide Protestant worship facilities during and after the VIII Olympic Winter Games.

Program and solution

In selecting a site for the church, the major considerations were: first, to find an area which would be accessible both to the Olympic area and also to the rest of the valley; and second, a setting which would take advantage of the natural beauty of the valley. The site chosen is in keeping with these requirements. It is located directly between the Olympic village and the Olympic games area with access both by foot path and road. The site slopes down to a small lake over which there is a view of the valley and Olympic area. The church will be seen from the road with the lake in the foreground and framed by a back drop of pine trees and mountain peak, which rises some 1,500 feet up from the valley floor.

The church consists of three elements: a chapel, a conversation area and a narthex. The latter acts as a connecting link between the other two. The chapel is designed to seat 100 persons with an overflow area for an additional 50. The chapel structure is a free standing reinforced concrete hyperbolic-paraboloid shell supported entirely at the two points of intersection with the ground. The selection of this shell evolved from a search for a form which would both reflect the sweeping grandeur of the surrounding ridges and valleys and also provide a simple, clean structure as a place in which to worship. It is felt that this form, in its simplicity, is in keeping with both the spirit of the site and of the winter Olympic games. The floor of the chapel was made to float above the ground and away from the walls, both to maintain the integrity of the shell form and also to allow the shell to wrap around the seating area, emphasizing the feeling of shelter. The axis of the shell was moved off center so that the space sweeps upward and out from the back of the chapel. The space is enclosed by a wall of stained glass set in vertical mullions; the glass will get lighter and more translucent toward the front of the chapel to further emphasize the directional aspect of the shell.

The church is entered from a series of decks which float above the grade as large planes. The entry and narthex act as a bridge connecting the chapel and the converse area. It will be walled in clear glass with a low solid roof, which will provide a contrast to the lofty rise of the interior of the chapel. The smaller building is a simple rectangular form, encompassing a conversation area with a fireplace, kitchen, minister's study and mechanical equipment. Its simplicity is in keeping with the theme of the church as a whole.

Chapel roof

FORM: Thin shell of reinforced concrete in a form of a hyperbolic paraboloid, symmetrical with respect to the longitudinal axis of the chapel; support at the two low points; distance between supports 36 feet, distance tip to tip of the surface approximately 78 feet (both dimensions measured horizontally); the roof is bounded by two parabolas which intersect at the points of support; since one of these is "longer" than the other (in plan approximately 52 feet, the other being approximately 26 feet) one of the tips of the surface is approximately 10 feet higher than the other; this is a unique feature of this shell and gives it a remarkably dynamic form, particularly appropriate to the inspirational character of the building.

STRESSES: Over a large part of the roof area the thin shell is in a membrane state of stress, i.e., only direct forces occur; in a relatively narrow zone close to the edges of the shell, and in particular in the zone of the shell close to the supports appreciable bending stresses appear; for this reason the usual 2¼-inch thickness of the shell, which is more than adequate to accommodate all the required reinforcement, is increased along the edges. At the supports, the thickening is gradual, unlike the usual type of construction where the edge beam is a distinct heavy element.

METHOD OF CONSTRUCTION: Guniting on forms, using high early strength cement for speed of construction.

SUPPORTS: The dynamic form of the shell causes it to be subjected to rather large unbalanced moments; these are transmitted within the shell to its buttress-like supports, sculptured in form, which in turn transmit the loads to appropriately designed footings; in order to reduce the possibility of even slight deflections at the tips of the roof shell the footings have been designed on piles.

LITERATURE

Literature cited in this department is available from various manufacturers and associations free of charge. To obtain copies, circle the keyed numbers on the reader service cards facing pages 1 and 46.

RECESSED LIGHTING

Basic square, round and rectangular recessed housings and trims, pendant and surface ellipses, pendant spheres, wall and ceiling brackets and *Fitall* housing for round trims are among items depicted in 1960 catalog of recessed lighting line. Catalog is in color. (24 pp.)

AIA FILE NO. 31-F

MFR: HALO LIGHTING PRODUCTS, INC.

Circle 300

300

TESTING EQUIPMENT

Recent catalog describes line of equipment for testing soils, concrete and building materials in conjunction with design and construction of buildings, bridges, etc. Approximately 1500 illustrations depict over 3400 items ranging from pocket sized penetrometers to completely equipped mobile laboratories and nuclear testing equipment. Listings include major equipment and all accessory items. Referenced to ASTM and AASHO specifications. (316 pp.)

AIA FILE NO. 35-N-7

MFR: SOILTEST, INC.

Circle 301

DATA PROCESSING

Illustrated folder enumerates advantages possible to office management through use of *Univac Service Centers* of data processing and computing machines. Such accounting tasks as tax reports and labor distribution said to be effectively resolved through use of service. (6 pp.)

AIA FILE NO. 35-H-4

MFR: REMINGTON RAND DIV., SPERRY AND CORP.

Circle 302

LETTERS/TABLETS

Form 5903 is current catalog of architectural letters and tablets. Contained are scale drawings of full alphabets in sixteen standard letter styles, produced in aluminum and bronze, technical information on bronze and aluminum alloys and finishes and recommended procedures for installation. Also included are specimens of nameplates, cornerstone tablets, memorial and sculptured plaques and pantographed plates. Data also presented on surface textures, standard border types and tablet letter styles. (12 pp.)

AIA FILE NO. 15-R-1

MFR: OREGON BRASS WORKS

Circle 303

303

RUBBER FLOOR TILE

Airpath, cushioned rubber floor tile, is subject of current literature. Booklet lists properties, features and types of applications which may benefit from use of product. Included in list are rooms housing office machines and computing and data processing machines, where minimum vibration is desirable. Acoustical properties chart, showing improvement in impact transmission loss for various floor tiles compared with bare concrete, is included, in addition to other technical data.

AIA FILE NO. 23-G

MFR: THE B. F. GOODRICH CO.

Circle 304

CONTROL CATALOG

Current publication contains information on complete line of control devices. Catalog includes descriptions of motor starters, both manual and magnetic, contactors, relays, solenoids, limit switches, push buttons, static control and pilot devices, pricing tables, features, wiring diagrams, dimensions and application information. Horsepower selection charts are listed for motors from ¼ through 200 hp. (72 pp.)

AIA FILE NO. 31-G

MFR: GENERAL ELECTRIC CO.

Circle 305

VIBRATION CONTROL

Current Practice in Isolating Buildings from Vibration with Lead-Asbestos Pads, is illustrated brochure showing examples of use of lead-asbestos pads to reduce or eliminate vibration in buildings adjacent to railways, subways or other heavy traffic areas. Used in footings of such buildings, lead pads said to absorb vibration usually passed from ground to structural steel. Photographs show operations of placing, positioning and grouting units on New York's Union Carbide Building. Engineering drawings and specifications are included. (4 pp.)

AIA FILE NO. 39-D

ASSN: LEAD INDUSTRIES ASSN.

Circle 306

STEEL SECTIONS

Recent catalog, No. D-60, includes details on roof deck sections, including 24″ steel roof deck said to speed installation approximately 50 per cent. Design features and engineering data are presented on line of deck plate for sidewalls, partitions, concrete floor forms and reinforcing. Section drawings, property and load tables are provided. (16 pp.)

AIA FILE NO. 12-C

MFR: BUILDING PRODUCTS DIV., THE R. C. MAHON CO.

Circle 307

BASEBOARD SYSTEM

Technical information on *Plugmold 2200*, multi-outlet baseboard system, is contained in recent folder. Information on devices and fittings, methods of fastening to various surfaces, installations and specifications are included. Also contained is description of unit with *Snapicoil* prewired receptacles ready to be snapped into holecut cover. (4 pp.)

AIA FILE NO. 31-C-62

MFR: THE WIREMOLD CO.

Circle 308

CEILING SUPPLEMENT

Technical Bulletin No. 12, Supplement No. 3, relating to metal lath suspended ceilings, is now available. Emphasising lighting details, supplement is worthwhile aid in providing metal lath and plaster data. Included are: details relating to light

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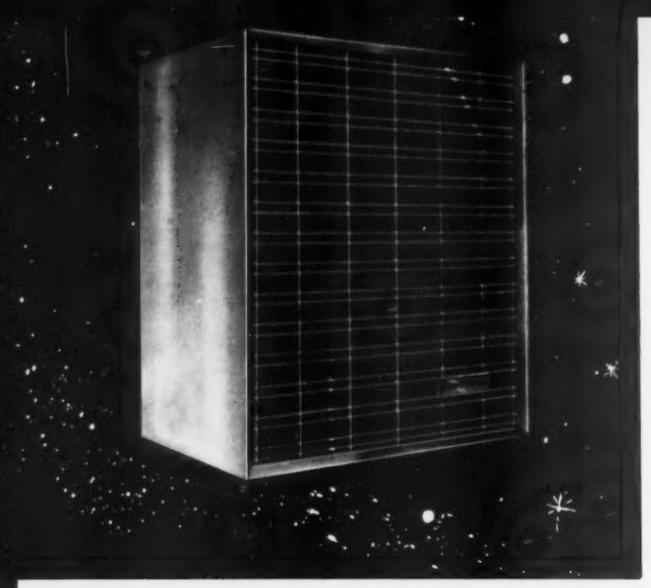

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and economy

New JANITROL

GAS-FIRED

commercial & industrial heating equipment

ALL NEW! JANITROL 67 SERIES UNIT HEATERS FEATURING. . . STELLAR NEW STYLING, PERFORMANCE AND DURABILITY!

New Janitrol 67 Series Unit Heaters are unusually handsome . . . incredibly quiet and efficient. They bring you, for the first time in unit heater history, distinctive appearance you can recommend for the smartest business setting. And they offer in even greater measure the traditional Janitrol quality and dependability in heating.

Their clean, crisp "look" is a departure from the crude, cumbersome industrial appearance of yesterday. Modern machine tools, trucks and structures have evolved as attractive, functional designs. And now, Janitrol sets the pace in unit heater styling!

The draft hood opening and adjustable louvers are concealed by the beautifully styled gold-tone grille. The rear combustion air inlet permits use of a solid bottom panel . . . eliminates any possibility of obstruction to combustion air intake.

Inside, design progress is equally significant. Yet every part is proven . . . every safety feature is included. Result? Performance no other unit heater can duplicate.

Naturally, the "heating heart" of every new Janitrol is the famous Janitrol Multi-Thermex heat exchanger with this unchallenged record for durability and low maintenance: among nearly three million heat exchanger tubes produced since 1940, replacements for all causes have run less than ¼ of 1%.

Investigate the many exclusive advantages of Janitrol 67 Series Unit Heaters for jobs you specify or install. Let them help build your reputation for quality.

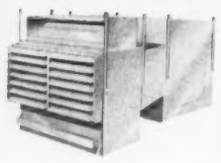
FEATURES THAT MAKE ALL OTHER UNIT HEATERS OLD-FASHIONED!

New "sheer look" styling—Beautiful Phoenix Beige finish • New gold-tone grille. Conceals louvers and draft hood opening • Low overall height • Automatic controls—Fully accessible • Factory-fired • Low Voltage Gas Controls—Standard • Low Voltage Sensitive Thermostat—Standard • Limit control—interrupts control circuits and shuts off fuel if unit temperature becomes excessive • Thermopilot Shut-off. Shuts off all gas, including pilot, in event of pilot flame failure • Automatic Pilot. Exclusive Janitrol low Btu. non-linting design • Quiet air delivery. Acceptable for schools and other applications where conventional units are too noisy • Motor prelubricated for 5 years • Built-in Draft Hood. Removable, provides full access to heat exchanger. Protects burners from abnormal up or down draft • Combustion air inlet. At bottom rear, through control enclosure. Controls constantly cooled by combustion air stream. Eliminates cross draft on burners • Ampli-Fire Ribbon Flame Burners. No flame contact on metal. Removable, with non-linting air shutters featuring thumb-screw adjustment.

MEET EVERY COMMERCIAL AND INDUSTRIAL HEATING NEED FROM JANITROL'S BROAD LINE

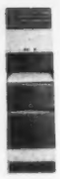
GAS-FIRED DUCT-FURNACES

Install in a duct where air is circulated by separate blower. Adaptable for use with cooling. Two sizes: 200,000 and 300,000 Btu/hr. input—may be combined to provide capacity from 200,000 Btu/hr. up, in increments of 100,000 Btu/hr. input. Six sizes, from 50,000 to 225,000 Btu/hr. in Duct 55 models.



BLOWER-TYPE UNIT HEATER

Allows air delivery from greater heights and against greater static pressures. Models with exposed or enclosed blowers. A.G.A. approved as low and high static-type blower unit heater for air delivery to duct system up to 1.0 in. W.C. external static. Heat sections factory assembled. Sizes: 300,000, 400,000 and 500,000 Btu/hr. input.



FLOOR-TYPE UNIT HEATER

Cold air drawn from floor level is heated, filtered and discharged horizontally overhead. Quiet, clean, carefree—ideal for offices, restaurants, stores, labs, etc., requiring a compact unit.

HEAVY DUTY BLOWER HEATERS

For unit heating, central heating and air conditioning. Wide range of standard blowers and motors assures correct air delivery and temperature rise in each application. Factory assembled and tested. Capacities from 250,000 Btu to 1,750,000 Btu/hr. input.

HORIZONTAL OIL UNIT HEATER

For suspension overhead. Saves floor space. Compact, efficient, low-maintenance design clean and quiet in operation. May also be used to feed duct system. Choice of sizes from 84,000 to 250,000 Btu/hr. output to meet all needs.

helpful data for
ARCHITECTS, CONTRACTORS AND ENGINEERS
write collect today for complete information on Janitrol units for heating with clean, economical gas in buildings of every type. There's no obligation.

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HEATING AND AIR CONDITIONING
A Division of Midland-Ross Corporation
Columbus 16, Ohio • In Canada: Moffats Ltd., Toronto 15

Also Makers of Surface Industrial Furnaces, Kathabar Humidity Conditioning, Janitrol Residential Heating and Cooling Equipment.

LITERATURE

troughs in suspended metal lath and plaster ceiling; light trough attached to wall; reflected ceiling plans with troffer openings; and typical section through a light troffer in membrane fireproofing.
AIA FILE NO. 20-B-1
ASSN: METAL LATH MFRS. ASSN.
Circle 309

FLOOR TREATMENT

Descriptive brochure presents data on quick drying treatment for concrete floors. Properties and advantages are covered, in addition to test results and specifications. (4 pp.)
AIA FILE NO. 3-B-1
MFR: WEST CHEMICAL PRODUCTS, INC.
Circle 310

GLASS BLOCKS

Informational booklet available on *Shade Green* and *Shade Aqua* glass blocks. Units reported to have solar selecting qualities in addition to color. Varied designs are presented, as well as sizes, dimensions, installation procedures and list of accessories for application. (4 pp.)
AIA FILE NO. 10-F
MFR: OWENS-ILLINOIS
Circle 311

INSULATION BOOKLET

Fundamentals of Building Insulation, explains how building insulation works, why it is used and where it should be used. Compiled as aid to architects, engineers, students and others. Single copies available without cost to individuals, and up to 30 copies are free to schools and colleges. Additional copies are $.40 each. (44 pp.)
AIA FILE NO. 37-B
ASSN: INSULATION BOARD INSTITUTE
Circle 312

LIGHTING

SKYLIGHT CATALOG

Annual brochure for 1960 consolidates information on line of *Marcolite* aluminum and fibrous glass panels for skylight installation. All designs are described, and recent installations are illustrated. (4 pp.)
AIA FILE NO. 12-J
MFR: THE MARCO CO.
Circle 313

FLOODLIGHTING CATALOG

Condensed catalog presents line of cast aluminum outdoor floodlights. Illustrations, specifications and dimensional drawings are provided on decorative outdoor bullets, medium and mogul base floodlights, high-intensity *Power-Beams,* emergency portables, wiring troughs, splice boxes and outdoor fittings, as well as cast aluminum pendant, ceiling and wall fixtures. (8 pp.)
AIA FILE NO. 31-F-22
MFR: STONCO ELECTRIC PRODUCTS CO.
Circle 314

FIXTURE CATALOG

Comprehensive catalog of commercial, industrial and institutional lighting fixtures is offered. Prices, specifications, lamp requirements and ordering information included for complete line of indoor and outdoor fluorescent and incandescent units. Troffers and recessed fixtures, surface and pendent units and strip lighting are among types presented.
AIA FILE NO. 31-F-2
MFR: WHEELER-FULLERTON LIGHTING DIV., FRANKLIN RESEARCH CORP.
Circle 315

CURTAIN WALLS

TRANSLUCENT BUILDING PANELS

Catalog for 1960 features *Sanpan* line of translucent panels, window walls and translucent curtain wall system. Scale drawings of panel types and accessory framing sections are included. (8 pp.)
AIA FILE NO. 17-A.
MFR: PANEL STRUCTURES, INC.
Circle 316

EXPANDED METAL MESHES

Illustrated catalog describes five architectural expanded metal meshes, for use as building exteriors, horizontal and vertical sunshades, stair and balcony railings and area dividers. Photographs of the five patterns, table of sizes, weights and dimensions are included. (8 pp.)
AIA FILE NO. 15-T
MFR: PENN METAL CO., INC.
Circle 317

ENTRANCES/WALLS

Entrances, store fronts and wall units of aluminum are described in recent publication. Technical data, photographs and detail drawings provide specific information on items in line. Installations are noted for the anodized, rolled and extruded units. (16 pp.)
AIA FILE NO. 16-A; 26-D; 17-A
MFR: BRASCO MFG. CO.
Circle 318

ALUMINUM CURTAIN WALLS

Recent catalog describes with quarter size details, significant changes in principal sections of aluminum window and curtain wall line. Additions deal with dual glazing and *Barcolor* system for incorporating color on grid members. Included are photo-

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new RLM specifications for industrial lighting fixtures

The latest edition of the RLM Standard Specifications book features *new specs* and *other changes,* important to finest lighting results and lower costs!

With new, higher I.E.S. Industrial Lighting Level Recommendations — it's more important than ever that you're up-to-date on the RLM quality concepts of lighting fixture design, construction, performance and maintenance features.

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Circle 122 for further information

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with **SPEED-RAIL SLIP-ON FITTINGS**
• no clamps, no washers, • no nuts to assemble

It's been proved many times that safety guard rails and balustrades built with Speed-Rail structural pipe fittings will save construction time and money. These unique fittings are simply slipped onto standard I.P.S. pipe and the set screws tightened with a hex wrench. Costly threading and welding are eliminated, pipe-cutting is reduced to a minimum.

SPEED-RAIL Fittings, and the heavier-duty NU-RAIL Fittings, are the original slip-on structural pipe fittings. They are also the simplest and strongest fittings for building pipe structures.

Be sure you have full information on the only truly complete line of structural pipe fittings—SPEED-RAIL and NU-RAIL Fittings. Leading distributors stock them; get all the facts now—write Dept. 18-S.

THE HOLLAENDER MANUFACTURING CO., 3841 Spring Grove Ave., Cincinnati 23, Ohio

Circle 123 for further information

< **Circle 121 for further information about Janitrol**

LITERATURE

graphs of typical installations, design recommendations and comprehensive specifications. (20 pp.)
AIA FILE NO. 17-A
MFR: E. K. GEYSER CO.
Circle 319

CURTAIN WALL PANELS

Current catalog contains 1960 revisions for line of insulated and veneered curtain wall panels. Presentation includes information on materials, colors, textures and finishes available on either mechanically assembled or laminated panels. Features of recently added laminated panel are included. (8 pp.)
AIA FILE NO. 17-A
MFR: THE ERIE ENAMELING CO.
Circle 320

PLUMBING UNITS

COLORED FIXTURES

Revised version of *Guide to Quality Plumbing Fixtures*, is available, stressing color and remodeling in bathroom planning. Line of colored plumbing fixtures is presented, in various bathroom arrangements. (20 pp.)
AIA FILE NO. 29-H
MFR: KOHLER CO.
Circle 321

METERING PUMP SERIES

Catalog is available, containing performance data on *Series 200* metering pump line. Unit is electrically driven and is of positive displacement, reciprocating, plunger type; designed to function with one, two or three liquid ends, for increased capacity. Features, dimensions and capacity-pressure selection data presented. (12 pp.)
AIA FILE NO. 29-D-5
MFR: WALLACE & TIERNAN, INC.
Circle 322

DRINKING FOUNTAINS

Current catalog describes with dimensional details, drinking fountain and water cooler line for 1960. Wall, pedestal and deck type fountains, single and multiple bubblers, commercial and restaurant coolers, in wall hung, standing or remote types are illustrated. (28 pp.)
AIA FILE NO. 29-H-1
MFR: HAWS DRINKING FAUCET CO.
Circle 323

HVAC

AIR CONDITIONING CHART

Reference chart showing full line of *Typhoon* air conditioning units is available. Listed are 136 air conditioning products and 49 gas and oil fired furnaces. Among those included are: water-cooled self-contained units in 13 sizes ranging from 3 to 75 tons; ceiling mounted water-cooled units of 5 and 7½ tons capacity; and line of residential type gas and oil fired furnaces.
AIA FILE NO. 30-F
MFR: TYPHOON AIR CONDITIONING DIV., HUPP CORP.
Circle 324

ELECTRIC BASEBOARD HEATERS

Recent bulletin describes type *BBC, Chromalox* electric baseboard heaters, designed to provide perimeter heating comfort in commercial applications. Features, specifications and suggested applications are presented. (2 pp.)
AIA FILE NO. 30-C-44
MFR: EDWIN L. WIEGAND CO.
Circle 325

AIR MIXING UNIT

Bulletin DD-6, catalog on *Dual-Duct* air mixing unit offiered, detailing air mixing units with patented, automatic volume control features. Photographs, performance data, specifications, dimensions and arrangements of systems for different building types and zoning arrangements is contained. (16 pp.)
AIA FILE NO. 30-D
MFR: BUENSOD-STACEY, INC.
Circle 326

WOOD UNITS

STRUCTURAL WOOD

Engineering in Wood—1960, is current catalog showing applications of various timber structural components. Detailed drawings, tables of dimensions and section properties, specifications and similar information is contained. Also included are examples of glued laminated domes. (24 pp.)
AIA FILE NO. 19-B-3
MFR: TIMBER STRUCTURES, INC.
Circle 327

HARDBOARD USES

Guide for Product Designers is available, describing various hardboards, their properties and applications in wide range of fabrication. Details of various construction methods are shown. Excellent strength tables are provided. (12 pp.)
AIA FILE NO. 19-E-6
MFR: MASONITE CORP.
Circle 328

FINISHED HARDBOARDS

Current brochure features *Evanite Driftwood* finished hardboards for residential and commercial use. Photographs show installations of product as interior ceiling and wall panel. Rapid application and durability stressed. (4 pp.)
AIA FILE NO. 19-E-6
MFR: HARDBOARD DIV., EVANS PRODUCTS CO.
Circle 329

LAMINATED WOOD MEMBERS

Manual of Design is available to architects and designers, containing information on glued laminated wood structural members. Included is information and design data on various types of laminated arches and beams, arch and beam connection details, comprehensive roof beam design charts, specifications for glued laminated construction, color selection chart for stain finishes and details and specifications on structural roof decking.
AIA FILE NO. 19-B-3
MFR: UNIT STRUCTURES, INC.
Circle 330

DOORS/PARTITIONS

MOVABLE PARTITIONS

Revised brochure for 1960 features *Weldwood* movable partitions. Illustrations and section drawings present details. Information provided on acoustical partition of veneered hardwood ⅛", 3-ply skin over *Novoply* core. Fire retardant panels with incombustible mineral core also described. (12 pp.)
AIA FILE NO. 35-H-6
MFR: UNITED STATES PLYWOOD CORP.
Circle 331

PARTITIONS CATALOG

Aetnawall partitioning catalog for 1960 presents five basic partitioning types, featuring extruded aluminum shapes with snap-on pilaster covers. Complete specifications and detail drawings are provided for five types. Photographs show variations. (24 pp.)
AIA FILE NO. 35-H-6
MFR: AETNA STEEL PRODUCTS CORP.
Circle 332

OVERHEAD DOORS

Current folder describes features of *Model 33 OVERdoor*. Such construction features as continuous shaft, torsion spring counterbalancing, automatic latching, wedge closing and automatic night lock are stressed. Designs and features are illustrated. (4 pp.)
AIA FILE NO. 16-D-1
MFR: BARBER-COLMAN CO.
Circle 333

LABORATORY DRAINLINE GUARANTEED FOR LIFE OF BUILDING

PYREX® Lifetime Drainline is guaranteed against corrosion and leakage for the life of the building in which it is installed.

The only exception is the understandable one of corrosion from massive volumes of hydrofluoric acid or hot alkalies.

The guarantee covers all other acids and alkalies even in combination.

NEW BULLETIN spells out the guarantee, explains why PYREX drainline is the least expensive you can buy when it's installed; also shows new one-bolt joint. Write for a copy of PE-30.

CORNING GLASS WORKS
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Circle 124 for further information

PARTITIONS/PANELING

Reference guide to movable partitions, from "rail high" to ceiling height has been made available. Four pastel color and four wood-grain surface finishes are listed as standard. Finishes are baked-on melamine plastic, abrasion resistant, cleaned with damp cloth. Listing of attachments and fixtures also included. (8 pp.)

AIA FILE NO. 35-H-6

MFR: WORKWALL DIV., L. A. DARLING CO.

Circle 334

PLASTICS

STRUCTURAL PLASTICS

Illustrated brochure describes use of reinforced structural plastics in *Uniparr* screen assemblies for water intake gates of steam power plants. Engineering details presented include flexural and tensile strengths and modulus of elasticity. Included are cutaway views of structural plastic members and illustrations of several installations. (12 pp.)

AIA FILE NO. 24

MFR: CTL DIV., STUDEBAKER-PACKARD CORP.

Circle 335

FIBROUS GLASS PANELS

Featured in 1960 catalog of building materials is *Windsorlite* line of translucent, lightweight, fibrous glass panels. Patterns are permanently embedded in material which is suggested for applications as room dividers, ceiling panels and outdoor screens. (184 pp.)

AIA FILE NO. 26-A-9

MFR: MORGAN-WIGHTMAN

Circle 336

MOLDING COMPOUNDS

The Test of Impact is technical literature providing data and applications for four impact polystyrene molding compounds: *TMD-6000*, high impact molding material; *TMD-5161*, high impact, heat resistant material; *TMD-9001*, medium impact styrene; and *TMD-8000*, medium impact, heat resistant material. General information on impact polystyrenes also included. (16 pp.)

AIA FILE NO. 24

MFR: UNION CARBIDE PLASTICS CO., DIV. OF UNION CARBIDE CORP.

Circle 337

MISCELLANY

HIGH FIDELITY COMPONENTS

As informational source to those architects specializing in custom residential units, topical catalog offers data on *Stereomaster* high fidelity components for 1960. Included are explanation of stereo, typical home installations and descriptions and technical specifications of components.

AIA FILE NO. 31-i-7

MFR: H. H. SCOTT, INC.

Circle 338

STORE DISPLAY SYSTEM

Catalog and planning manual is available, covering *Vizusell* merchandising and display system for retail merchandise. Flexibility and versatility stressed. Drawings, specifications and photographs of installations included. (84 pp.)

AIA FILE NO. 35-H-5

MFR: L. A. DARLING CO.

Circle 339

METALLIC COATING

Zinkote, inorganic zinc coating, applied in one coat by brush or spray, is subject of current bulletin. Designed to provide protection to metal surfaces exposed to atmospheric corrosion, water and salt air. Corrosion resistance stressed. (2 pp.)

AIA FILE NO. 7-A-3

MFR: AMERCOAT CORP.

Circle 340

WELDING SYMBOLS

Designer's Guide for Welded Construction offered for engineers and draftsmen, revised to include recent revisions in the Standard American Welding Society symbols. Charts and illustrations provide information on application of welding symbols and other basic design data on welds. Included are specification tables on types of electrodes. (6 pp.)

AIA FILE NO. 13-C-3

MFR: LINCOLN ELECTRIC CO.

Circle 341

REFRIGERATOR CATALOG

Intended to serve as reference work, refrigerator catalog has been condensed. Brief descriptions of units in refrigerator line provide basic specifications and dimensional information.

AIA FILE NO. 30-F-6

MFR: KOCH REFRIGERATORS, INC.

Circle 342

GLASS DRAINLINE SYSTEM

Recent bulletin describes *Pyrex* lifetime drainline system for disposal of corrosive wastes. System, engineered for vertical or horizontal mounting and for burial in ground, consists of corrosion-resistant, tempered glass piping and fittings. Property data, list of available fittings, schematic drawings and tables are included. (12 pp.)

AIA FILE NO. 29-B-8

MFR: CORNING GLASS WORKS

Circle 343

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Circle 126 for further information

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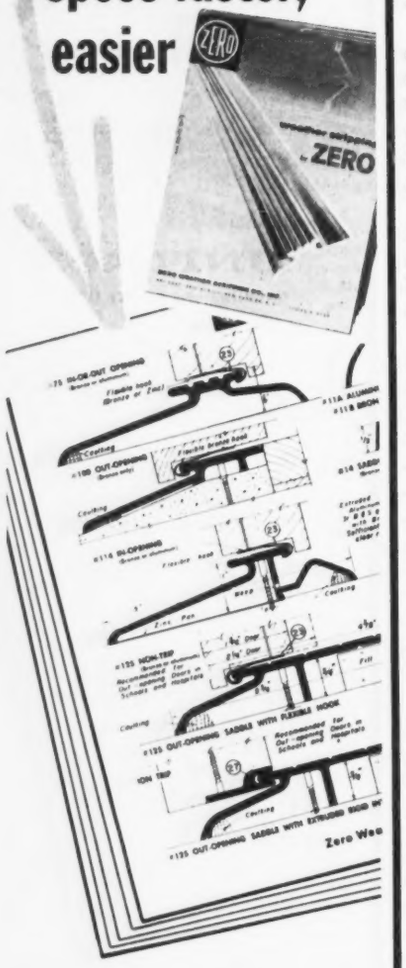

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Circle 127 for further information

The economic value of design

From an address by Graham J. Morgan, Executive Vice President of United States Gypsum Co., at the convention of the American Institute of Architects, June, 1959, New Orleans.

"Many words have been used to describe the process of blending aesthetics, structural principles, functional design, thousands of products, and money, into a completed building, but one word which has particularly appealed to me is *harmony*. . . .

"The reason the word appeals to me is that it applies equally well to a successful architect-client-supplier relationship as it does to the successful completion of a building. . . .

"I would like to break the subject of harmony into two parts and examine each of them briefly with you. First, the problems in arriving at a balanced harmony in the architect-client-supplier relationship; and, second, the challenge in developing acceptable methods of measuring building materials to provide the proper harmony of performance, appearance, and function in matching the owner's needs and the architect's design requirements. [That is]—the mutual understanding of physical principles....

[Let us first] "consider the subjective aspects of the *architect's background, the client's wants*, and the *benefits of the supplier's product*.

"As a result of your professional training—and the way you approach a problem—you must consider yourself as a master builder who is charged with a responsibility of manipulating space — shapes — materials — colors — and textures to provide a satisfactory answer for the client's wants. As professional men, you are justly proud of your 'creativity,' 'individuality' and 'sense of design.' These are talents without which you could not effectively function. . . .

"The client's wants can be classified as comfort—safety—protection—and prestige, among others, and yet constantly limiting this desire for aesthetic and functional satisfaction is the economical expression of 'how much is it going to cost?'

"Look at the supplier who knows that his products should be promoted on the basis of the benefits they will provide in quiet—warmth—visual effect—beauty—privacy—etc., but is constantly faced with the problem of fire tests—dead weights—racking strengths—sound transmission—and, of course, the bugaboo of cost and the need to make a profit.

"Money and sheer economics very obviously, then, are limiting factors to this relationship regardless of the viewpoint we use in examining it. So it should appear that it is necessary for us to be more skillful in treating economy as subjectively as possible. This is not too difficult to do if we retain, in our thinking, the fact that, if there were no people, economics would be merely academic—it wouldn't even exist. . . .

"I believe our mutual challenge is for each group to better understand the viewpoints and problems of the others in evolving a result which we all seek—the balance-point where the added cost of better design and better materials provides an economic result to the client-owner which more than repays him for the added investment. Conversely, the manufacturer has the responsibility to develop materials that better meet the architect's design standards and the owner's budget limitations. The need for each group to work on this problem is particularly true in an era that combines a greater appreciation of good design and continuing rise in construction and land costs.

"Of course, this may sound like oversimplification of a very complex problem, but it brings me to my second point, and principal contention that a mutual understanding of *physical principles* is the one way in which all the subjective factors represented by good design, and all the objective factors represented by money, can be blended together. It is the understanding of these physical principles which can most economically convert lines, sketches, elevations and renderings into a successful job made up of wood, stone, metal and money. . . .

"We are proposing, then, that the physical principles which can be established, which can be demonstrated, and can be made available to everyone, are the platform on which harmony can exist. Here are some broad classifications of the physical sciences in which the architect, the client and the supplier are constantly involved: (1) sound; (2) light; (3) heat; (4) fluid mechanics; (5) chemical reactions; (6) structural properties; and (7) measures and dimensions.

"Each of these is broad and inclusive—subject to analysis, measure and calculation. Knowledge and mutual understanding of each of these is essential to the intelligent planning and design of a building and to the design and development of building products and systems. . . .

"There can be no doubt that the architect's horizon must include building products, and that these products are just as important economically as the buildings in which they are used. With all the trends which appear to be coming with changes in materials and methods, there is one thing that cannot be overlooked; products and systems will continue to change, just as design and aesthetic desires will change. However, the physical principles which underlie the wants of people cannot change. On this point, I rest my case. Better understanding of physical principles will produce *harmony* in the architect-client-supplier relationship, and will produce better buildings."

Realty lease-back deals

From a talk by Sidney M. Barton, president of Sidney M. Barton Co., given as part of the annual educational course of the Real Estate Board of New York, Inc., on November 10, 1959.

"The device of building property, selling it and then leasing it back for one's own use is not particularly new. A few deals can be traced back to the nineteenth century, but today under the proper title of 'lease-back' over $3 million sale and lease-back transactions have been made.

"Big business realizes the tremendous advantages a lease-back has over any other type of 'owner-operator' deal. They realize they can virtually have their cake and eat it.

"Lease-backs are mostly entered into by the . . . market leaders. . . .

"They need the dollars invested in property and building to be used for their own business . . . and not have it tied up in bricks and mortar. So they purchase the properties, build the stores and then sell the stores to a lease-back investor for an amount to the exact penny of their investment. The final operation is to lease-back

their own property on a long term lease. In this final analysis they have built the building they want, in an area of their choosing and have gotten back every cent they put into it. . . .

"Basically there are three ways for an organization to expand their operations by building new stores, factories or warehouses: (1) build and own; (2) float a bond issue; and (3) sell and lease back.

"Issue number one has been shown that ownership is not the answer as it ties up capital and defeats the profit factor. The bond issue is employed in many instances. However, the bonds must be sold to many people in units of $1,000 or more to raise the millions necessary. It is a painstaking and time-consuming effort.

"The lease-back program is an investor's paradise . . . for big money. Financial giants with anywhere from $100,000 and up can make profitable long term investments in blue chip issues with an impossible loss factor short of a super-grave national disaster.

"A successful lease-back investor is only as good as his ability to borrow money, fast and cheap. This money usually comes from insurance companies, pension and trust funds, union beneficial funds, some banks and churches.

"Tight money has hurt the little builder, the small owner and the small shop-keeper. They cannot get the necessary money to expand. The big fellow gets by. He doesn't want to pay 5¾ or 6½ per cent for money, but if that is the way it has to be, he can handle it. The top level lease-back users can resort to large personal cash investments with larger profits to combat the scarcity of money at the right price. . . .

"The lease-backer makes the purchase and creates the lease-back. He then will call a select group of his investors, apprise them of the new lease and the lessee. . . .

"Lease-back deals today are not confined to chain stores or warehouses. As the years go on, new business has come in. Airlines purchasing millions of dollars worth of jets cannot tie up their money in airplanes, international steamship lines need new ships, motion picture chains need new theaters, office buildings, ball parks, service stations and all business, new and old, is casting more than a glancing eye at lease-backs and the invested dollars reward."

DIGEST:13

PROBLEMS OF DEVELOPMENT OF THE ROOFING SYSTEM

From a paper by M. D. Chamberlain and E. F. Bennett of Koppers Co., Inc., Tar Products Div., Verona, Pa., delivered at the Building Research Institute 1959 Fall Conferences, Washington, D. C.

Introduction

As the title indicates, the subject of this paper is quite broad and, in our opinion, embraces all factors influencing the service life of roofing. For the purpose of this paper, the term, *roofing system* is the waterproof roof covering, roof insulation and roof deck, as an entity. Moreover, this paper is restricted to bituminous *built-up* roofing for low slope roofs.

The most extensive use of this type of roofing is for industrial and commercial buildings. It is now also being used to some extent in flat roof single-story residential structures with the present architectural trend to that type of construction.

Built-up roofing, as the name implies, is *built-up* in alternate layers of membranes and bituminous waterproofing. To the top surface of the built-up sandwich type structure a heavy pouring of the bituminous material is applied as a protection for the underlying bituminous layers and membranes. With asphaltic materials, this top pouring may be the finished roof surface or further protection may be afforded by embedding slag or gravel into it. If coal tar pitch is used, gravel or slag is always applied. The reinforcing membrane may be asbestos or rag felt saturated with asphalt or tar. In recent years felted or woven glass fiber membranes have also been used for this purpose but these membranes will not be considered in this discussion. The bituminous material used is the waterproofing agent, the membranes serve to stabilize the bituminous material and strengthen the roof cover. Without the bituminous waterproofing, the felts absorb water and rapidly deteriorate.

Waterproofing

The first factor to consider is the ability of the waterproof cover to withstand the environmental conditions to which it will be subjected in service over an extended time period. The principal factors influencing the serviceability of the bituminous materials are: (1) resistance to atmospheric conditions including ultra-violet light, water penetration and oxidation; (2) suitable rheological properties; (3) adequate adhesion between membranes and, if aggregate cover is used, adequate adhesion of the aggregate to the top pouring of bitumen. The system in which the bituminous material is used also has to be considered from the standpoint of fire resistance, material and labor costs, and application characteristics under various climatic conditions.

Structural

For a thorough understanding of the problems in the development of the roofing system it is necessary to have a clear understanding of the relationship of the various components. Not only must the roofing cover prevent water penetration but the roof system must also be capable of withstanding live loads such as snow, structural stresses, and changes in temperature and humidity within the structure. Settlements in buildings, cracks in roof decks, differential movement of the components within the roofing system and expansion and contraction of the entire structure due to changes in temperature, place stress on the roof system. Provision for adequate expansion joints through the structure and the roofing system should be made on the drawing board when the building is designed. Structural expansion joints should be constructed with adequate curbs. Any expansion joint which is only in the roof covering is of questionable value. The expansion joint should also extend through the deck and building structure.

Roof decks

The first variable in the roofing system is the roof deck. This can be of wood, concrete, gypsum, preformed cemented wood fibers and lightweight concrete. Wood decks, treated or untreated have been used for many years. Newly developed treatments provide fire retardant and decay resistant wood decking. There is a wide variety of metal decks of different gauge, flute openings and span lengths. Poured concrete and gypsum decks are also used. When pre-formed or pre-cast units are used, the question of moisture is not a problem. With poured decks, the entrained water may be trapped and affect the roof cover.

The fastening of other components to the deck must be taken into consideration. If moppings of bituminous materials or adhesives are allowed by construction specifications, these must have sufficient bond strength to hold the next component to the deck. If the roofing cover is nailed, the type of nails and the retention of nails become an important detail. The moisture absorption property of the deck is also of major importance as moisture vapor may be present when the roofing system is applied or moisture vapor may accumulate due to high humidity within the structure. The roof deck must also be capable of withstanding dead and live loads, both during and after construction, without excessive deflection which would cause distress to the roof cover. The major problem of concern in the roofing industry is the deflection of the roof deck during construction under the wheel loads of mechanical roofing equipment. All decking is designed for deflections less than 1/240th of the span length. A wheel load moving across the joints of a deck is more serious than one in the direction of the span.

Vapor barrier

The service life of a roofing system may be dependent on whether a vapor barrier is installed. It is a very important design decision. If a vapor barrier is installed on a deck, and moisture is present due to climatic conditions during construction or from other causes, the built-up roofing cover, and the vapor barrier form a trap for the moisture. If the vapor barrier is omitted, it is possible for moisture vapor within the building, under the pressure gradient due to temperature differences between the inside and outside, to cause condensation and moisture accumulation in the roof system during the winter season. If the vapor barrier is broken due to movement of the building or other causes, the same condition exists.

In recent years the fire rating of the vapor barrier has been a concern of the insurance companies so that non-combustible vapor barriers have been developed. Vapor barriers have different degrees of effectiveness in preventing the movement of moisture

(Continued on page 44)

vapor. Even vapor barriers with low vapor permeability in time may accumulate considerable quantities of moisture within the roof system and cause difficulty. A two-ply vapor barrier with bituminous moppings has a perm rating of zero.

Insulation

With the advent of air-conditioning as well as metal decking, insulation is used on a majority of the roofs constructed today. A variety of insulation materials are being used—wood fibers, glass fibers, cork and poured lightweight insulations. It is not the purpose of this paper to discuss the thermal characteristics of insulation, but to discuss insulation as part of the roof system. If any moisture is in the insulation originally or gets into it during construction, the effect of this water and water vapor can be serious on the roofing system. The strength of the insulation and the proper placing of the insulation becomes an important factor in the roofing system because insulation is made in various thicknesses and sizes and must span various widths of web openings in metal decks. The stability of the insulation, change in dimension with change in moisture content, and the manner of fixing the insulation—particularly if it is a poured insulation—are also very important factors. It is recognized that insulation increases the black body temperature of the cover during summer heat and keeps it cooler in the winter. The insulation must also be compatible with the adhesives or bitumens used for the built-up roofing. It must be able to retain nails if the roof slope requires nailing. At the present time, one of the problems facing the industry is the wrinkling of the cover over joints in insulation. It is believed this is due to either dimensional change or warping of the insulation, water vapor pressure trapped in the insulation or a combination of these factors. Whenever the so-called *wrinkle pattern* occurs, eventually the bituminous material along with the slag or gravel—if aggregate cover has been applied—will move, leaving bare felts causing early disintegration at the location of the wrinkle. It has been observed that wrinkles will re-appear in the same pattern if a new roof is applied over the existing insulating material. Various attempts at venting during construction or after a roof is in distress have been made, but there is no complete solution to the problem at the present time.

A special type of insulation which roofing materials' manufacturers have been asked to consider as a base for built-up roofing, is one which seves not only as insulation, but also as a structural unit of the roof. The same problems of moisture and dimensional stability exist in this type of material as with other insulations.

Application

In general, workmen do a capable job in the construction of the roof system. Workmanship is extremely important and any errors in application affect the life of the roofing system. Climatic conditions during construction is one of the principal problems. There is a limited number of good construction days in any geographic area of the country. The present trend is to proceed with construction throughout the year. The roof system is always one of the first items to be completed after the structural system of a building is erected so other trades are kept *in-the-dry* during the remaining construction. Therefore, the roofing contractor is sometimes asked to apply the roofing system under very adverse conditions. Damage by other trades after the roofing contractor has completed his work sometime occurs.

Occupancy

Failure to design the roofing system for the type of occupancy of a building can contribute to roof problems. Under high humidity conditions in laundries, swimming pools, bakeries, and industrial operations such as textile mills that require humidity control, there is a pressure gradient between the inside and outside of the roof system because of the differential temperature. This results in condensation within the roof system. The lack of a vapor barrier or a break in a vapor barrier can cause deterioration. A special case is the vibrations transferred to the roofing system due to the speed and number of looms in a textile mill. This vibrational force may cause movements opposed to the force of gravity. Another example is in an apartment building where a reinforced concrete slab serves as the ceiling. There is movement of moisture vapor and resulting condensation within the roof system above the slab. Roof covers may split due to the magnitude of difference in temperatures between inside and outside. This difference in temperature causes movement between the roofing and the structural system of the building.

Flashings and drains

The drains extending through the roof are subject to the inside and outside temperatures. Expansion joints for roof drains should be provided at the roof level. The details and installation of flashings whether they are at parapet walls, projections through the roof, or perimeter gravel guards are very important. Felts should be folded back to prevent movement of low softening point bituminous materials under the gravel guards.

Wind damage

Within the past several years insurance people have become particularly concerned about wind damage to the roofing system. The influencing factors include the fastening of the deck to the structure; the installation of the vapor barrier—if one is used—either mechanically or with adhesives to the deck; the setting of the insulation and its internal strength; and the fastening of the built-up roof covering to the deck or to insulation. Any element in the system may become critical in the resistance to wind uplift. The total roof system must be designed to resist an uplift force of 30 to 45 pounds per square foot.

Specifications

For a bituminous material to be accepted, specifications must be prepared which are acceptable to such national organizations as the American Society for Testing Materials, federal agencies and Underwriters' Laboratories. Present day specifications only show test values by empirical methods of test. Current specifications do not contain performance tests, and no adequate short term performance tests are known. Consequently, specifications alone do not insure performance. Therefore, specifications of necessity must be based on observed values for materials of the same generic type and source known to have given years of satisfactory service under various kinds of application conditions and exposure environment. The other material elements in the roofing system should also be time-tested in addition to having merely material specifications.

The specification for the proper application of the components in a roofing system is of equal importance to the successful performance of a roofing system. The influencing factors described must be considered in the development of the design of a successful finished roofing system.

BOOKS

The World Beneath the City by Robert Daley. *Philadelphia and New York: J. B. Lippincott Co., 1959. 233 pp., illus.*

This is a wonderful story of the complex beneath the sidewalk grade level of New York City in which the author finds there are 7,000 miles of gas mains, 5,000 miles of sewers, 2,200 miles of TV cables, 15,000 miles of telephone lines—enough to circle this planet 600 times. Daily, 8,700 subway trains thunder along 726 miles of track. For those who are fascinated with the inner workings of a great metropolis, here is a stimulating account by veteran journalist, Robert Daley. It is delivered in an excellent descriptive style ornamented with anecdotes, personalities and statistics which should provide the reader with a good measure of entertaining reading.

The story of a smugglers' tunnel under Brooklyn, derelicts living in skid-row luxury below Park Avenue, and an alligator hunt through the sewer system are all part of this lively narrative. There is also the story of Teddy May (among other characters), who worked more than half a century in the sewers and who loved them so much that he used to take long walks in them on Sunday afternoons—or so the story goes.

For a light moment, this book is recommended to any architect, engineer, urban planner or just about anyone who still likes a city and a bright tale about what makes it tick.

JJC

The Embattled Executive *by Lydia Strong with drawings by Al Hormel. New York: American Manage- Assn., 1959. 96 pp., illus. $1.95.*

This book of cartoons highlights the humourous side of the executive's job. Has fun with such subjects as, "How to wreck a conference," "How to fluff a speech" and "The gentle art of decision making."

Design and the Production of Houses *by Burnham Kelly. New York: McGraw-Hill Book Co., Inc., 1959. 428 pp., illus. $10.00.*

Survey by various authorities of proc-

(Continued on page 46)

EDITORIAL

THE DECADE BEFORE US

This writer has just experienced, within the span of time of an average working day, a jet flight which carried him from the jagged, craggy man-made heights of Manhattan to the mediterranean-blue Pacific shore of the Golden Gate and that jewel of American cities, San Francisco.

As one is carried across the vast stretches of this continent in barely more than six hours of time, one cannot but be impressed with the meaning and impact of this conquest of distance, in time, in space and in human communication.

Looking down from a height of 31,000 feet across a table-model scale of this nation, one also sees an America that will have 50 million more citizens in an all-too-brief fifteen years. In that same time, we will bear witness to an explosive economy in which the literal building of a new America will be underway. It will be an America in which our total national product in construction will be virtually doubled. This is the forecast of our economic experts.

For the architect and the consulting engineer this may mean a tremendous re-orientation in the powerful, positive role that he may play in the expanding horizon of our mutual professional areas.

The problems of urban blight, or higher standards for our cultural, educational, social, commercial and industrial institutions will achieve a new meaning for the practitioner.

Contemporary science with its implicit wonder will generate a new environment—both physically and psychologically for all Americans in the decade ahead. The professions will be called upon to fulfill their appropriate and responsible roles within this dynamic framework.

A continuing and conscientious attitude toward greater professional participation in public life is being forced upon us. This obligation of leadership is necessitated by the very nature of change itself—independent of our own reservations or recalcitrance.

This is also a worthy challenge and a golden promise for all of us. To a beautiful decade ahead. *JJC*

NAMES

JOHN S. BOLLES, AIA In an age of specialization, there is a refreshing touch of the Renaissance man in Architect-Engineer John S. Bolles of San Francisco—spanning as he does both of these professional disciplines. However, he is equally well known for an impressive contribution as a civic, artistic and intellecual figure in his community.

A native Californian, Bolles began his career as a civil engineer upon graduation from the University of Oklahoma. He engaged in practice as a structural engineer for a brief period in that state.

Soon thereafter, he decided to pursue graduate study in architecture at Harvard University. This course of action undoubtedly was prompted by a long-standing interest in cultural anthropology and archeology and perhaps the desire to emulate his Architect-father, Edward G. Bolles.

In the early 'thirties, Bolles was able to realize his historical interests through his association as architect with various archeological expeditions conducted by the Oriental Institute of the University of Chicago. Anatolia, Egypt, Persia and Yucatan are some of the many exotic climes to which his research work as architect led him. He was also engaged as architect for the Medieval Academy of America at Cluny, France, and the Carnegie Institute of Washington in Mexico.

In 1935, he returned to San Francisco and was admitted as a partner to his father's architectural practice. Eventually, Bolles established his own practice which has, through the ensuing years, encompassed a great diversity of building types—schools, shopping centers, department stores, banks, housing and many other institutional and industrial projects.

Among the most recent projects are the new baseball stadium home for the San Francisco Giants at Candlestick Park and the projected re-development of 80 city blocks of the Embarcadero—San Francisco's waterfront district. This project is in association with Architect Ernest Born, FAIA, of San Francisco. This program is designed to re-vitalize this waterfront area by providing a cultural group consisting of legitimate theaters, concert halls, a fine arts museum, an art school, an international exhibit area and a vast recreational facility.

Election to many high professional society offices attest to the recognition Bolles has received by his fellow architects. He has served as president of the State Assn. of California Architects, president of the California Council of Architects and as president of the Northern California Assn. of Architects. He has also held high office on many civic commissions among which are the Mayor's Committee for Removal of Temporary Housing Assn., the San Anselmo Planning Commission and the San Francisco Building Industry Code Committee.

As one of San Francisco's leading patrons of the fine arts, Bolles has been elected president of the Marin Society of Artists, president of the San Francisco Federation of Arts, and president of the San Francisco Art Assn. In 1952, he was the recipient of the Artists Equity Fine Arts Award.

An early interest in collecting the works of French moderns eventually matured into the establishment of the Bolles Gallery on San Francisco's colorful Gold St.

This project, which had its beginning as a hobby, has flowered into a handsome center for presenting the works of artists of unknown status and of artists of established reputation. Of recent origin, the Bolles Gallery opened with a comprehensive exhibit of the works of 17 American painters who had participated in the International Fair at Brussels. Those architects who will be attending the 1960 convention of the AIA at San Francisco should avail themselves of an opportunity to visit this unusual gallery.

It provides an environment in which a practice of architecture and engineering flows in a wonderful world of painting and sculpture. It is of the moment to note that the integration of the arts and the growth of local artists is encouraged to realization by one of the city's most distinguished architect-citizens.

In pursuing his professional interests, Bolles feels that it is the singular responsibility of the architect to impart a "plus" value to any amenity or facility he may design. He would caution against losing sight of the economics of any bui'ding program—but within the limitations of any architectural project there is always room for the architect to impart a quality of cultural continuity to his finished work. He believes that the architect and engineer should undertake a greater measure of civic and public participation because the essential nature of his work molds the ultimate character of the cities in which we live. To him, there is a great reward to be had from a conscientious study of our architectural heritage. The lessons of the past furnish the means of assessing the validity of our thinking of today and of our planning of tomorrow. *JJC*

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BOOKS

(Continued from page 45)

ess by which single new houses are designed and produced. Includes discussions of the mobile home industry, a balanced treatment of labor, constructive criticism of controls, analyses of relationships between design and production, and descriptions of advances in housing.

The Audio Cyclopedia *by Howard M. Tremaine. New York: Howard W. Sams & Co., Inc., 1959, 1,280 pp., illus. $19.95.*

Extensive source book covering every phase of audio engineering from basic principles of sound through methods of recording and reproduction, magnetic and optical film recording, motion picture projection equipment, test equipment, installation techniques, general information charts and tables, etc.

Introduction to Twentieth Century Design from the Collection of the Museum of Modern Art *by Arthur Drexler and Greta Daniel. New York: published by Museum of Modern Art, distributed by Doubleday Book Co., 1959. 99 pp., 133 illus. $2.95.*

A selection of the most beautiful useful objects of the past 60 years, acquired for the Museum of Modern Art Design Collection. Contains 133 photos of objects chosen from some 850 in the collection, including furniture, fabrics, glass and silver, machine tools and electronic equipment. Text describes the design evolution since 1900 of things we use and live with.

Matrix Calculus, *Second Revised and Enlarged Edition, by E. Bodewig. New York: Interscience Publishers, Inc., 1959. 452 pp. $9.50.*

New edition has been considerably expanded. Literature references brought up-to-date, through 1958.

Calculus *by Richard E. Johnson and Fred L. Kiokemeister. Boston: Allyn and Bacon, Inc., 1959. 634 pp., illus. $7.75.*

The theoretical basis of calculus is stressed rather than the applications. Numerous exercises are given.

INDEX

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cover 4	American Brass Co.
29	American Pecco Corporation
5	Armstrong Cork Company
46	Bilco Company
33	Julius Blum & Company
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25-29 STRESS MEASUREMENT SYMPOSIUM: Arizona State University.

28-30 NORTH CAROLINA CHAPTER, AIA: 46th annual meeting, Sir Walter Hotel, Raleigh, N. C.

Feb. 1-4 AMERICAN SOC OF HEATING AND AIR CONDITIONING ENGRS: annual meeting, Dallas, Tex.

2-4 SOC OF THE PLASTICS INDUSTRY: 15th reinforced plastics division conference, Edgewater Beach Hotel, Chicago, Ill.

5-7 HOME IMPROVEMENT PRODUCTS SHOW: 4th annual show, Navy Pier, Chicago, Ill.

14-18 AMERICAN INST OF MINING, METALLURGICAL AND PETROLEUM ENGRS: annual meeting, New York City.

14-18 NATIONAL ASSN OF CORROSION ENGRS: annual meeting, Dallas, Tex.

25 THE ARCHITECTURAL LEAGUE OF NEW YORK: national gold medal exhibition of the building arts held in collaboration with the American Craftsmen's Council through May 15. Museum of Contemporary Crafts, New York City.

Mar. 14-17 AMERICAN CONCRETE INST: convention and exhibit, Hotel Commodore, New York City.

April 5-7 BRI: spring conferences, Statler-Hilton Hotel, New York City.

18-22 AMERICAN INST OF ARCHITECTS: annual convention, San Francisco, Calif.

May 1-4 AIR-CONDITIONING AND REFRIGERATION INST: board and annual meeting, The Homestead, Hot Springs, Va.

11-16 WORLD DESIGN CONFERENCE, Sankei Kaikan, International Hall, Tokyo, Japan.

May 12-14 AMERICAN INST OF ARCHITECTS: south Atlantic regional conference, Winston-Salem, N. C.

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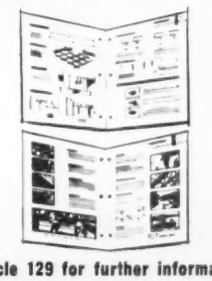

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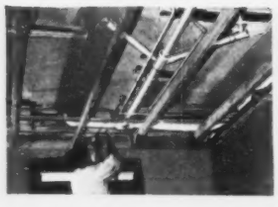

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